Université de Montréal

La contribution des pairs au processus menant à l'obtention du diplôme d'études secondaires

par

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Thèse présentée à la Faculté des études supérieures

en vue de l'obtention du grade de

Philosophiae Doctor (Ph.D.)

en psychologie

Août 2007

Université de Montréal
Faculté des études supérieures

Cette thèse intitulée :

La contribution des pairs au processus menant à l'obtention du diplôme d'études secondaires

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Résumé

Cette thèse a permis d'étudier le rôle des pairs dans le processus menant à l'obtention du diplôme d'études secondaires. La première étape de ce travail, présentée dans l'article 1, consistait à recenser les travaux théoriques et empiriques permettant de formuler des questions de recherche pertinentes. Il en est ressorti que : (a) les expériences avec les pairs peuvent être classées en deux grandes catégories, selon qu'elles émergent d'un contexte de groupe (ex. acceptation par les pairs) ou des interactions dyadiques (ex. amitié) ; (b) ces deux niveaux d'expérience sont probablement des prédicteurs indépendants de l'adaptation scolaire ; et (c) d'importantes questions d'ordre temporel devraient être prises en compte dans les prochaines études empiriques.

L'article 2 visait à valider une chaîne développementale dans laquelle différents facteurs de risque mesurés à l'enfance et à l'adolescence sont reliés au statut de diplômé à 23 ans. Cette chaîne développementale, inspirée du modèle socio-interactif (Patterson, DeBaryshe, & Ramsey, 1989) et du modèle « participation-identification » (Finn, 1989), a été mise à l'épreuve grâce à la participation de 997 garçons et à la réalisation d'analyses d'équations structuales (SEM). Les amitiés réciproques avec des pairs agressifs-turbulents à la préadolescence ont joué un rôle significatif dans le cadre de cette chaîne développementale, mais la contribution de l'acceptation par les pairs n'était pas significative.

L'article 3 visait à déterminer si le rôle de l'acceptation par les pairs et de l'amitié réciproque dans le processus d'adaptation scolaire pouvait être exacerbé à certaines périodes du développement. Les données ont été recueillies auprès de 437 garçons et filles, de la 2^{e} année du primaire à la 1re année du secondaire. Selon les analyses SEM, le modèle parallèle, dans lequel les deux types d'expériences avec les pairs étaient reliés au rendement scolaire durant l'enfance et l'adolescence, était supérieur au modèle séquentiel, dans lequel seule l'acceptation par les pairs était reliée au rendement scolaire durant

l'enfance, et seule l'amitié réciproque était reliée au rendement scolaire à l'adolescence. Certains liens présumés du modèle parallèle n'étant pas significatifs, il semble pertinent de mesurer d'autres types d'expériences avec les pairs et de rapprocher les temps de mesure.

Mots-clés : acceptation sociale, amitié, développement psychosocial, diplomation, engagement scolaire, études longitudinales, modélisation par équations structurales, pairs, rendement scolaire.

Abstract

The main objective of this thesis was to verify whether peers contributed to the developmental process leading to secondary school completion. A first step towards this end was to review theoretical and empirical work that could help identifying relevant research questions. This review is presented in the first article, and it revealed that (a) peer experiences can be broadly categorized as "group-level experiences" (e.g., peer group acceptance) or "dyadic experiences" (e.g., friendships); (b) these two general types of peer experiences probably contribute independently to students' academic adjustment; and (c) important time-related issues will need to be addressed in future research on the role of peers in the process leading to academic adjustment.

The second article tested the validity of a developmental chain that was meant to explain the association between child and adolescent risk factors and the failure to graduate from secondary school by age 23. This developmental chain was based on the social interactional perspective (Patterson et al., 1989) and on the participation-identification model (Finn, 1989). Participants were 997 French-speaking boys. As predicted, structural equation modeling (SEM) analyses revealed that reciprocated friendships with aggressive-disruptive peers during preadolescence played a significant role within this developmental chain; in contrast, the contribution of low acceptance in the peer group was not significant.

The third article tested whether the contribution of peer group acceptance and of reciprocated friendship to academic adjustment was restricted to specific developmental periods. Peer experiences and academic achievement were measured yearly from grade 2 to grade 7 in a sample of 437 French-speaking boys and girls. SEM analyses revealed that the parallel model, in which both types of peer experiences predicted academic achievement in childhood and early adolescence, had a better fit than the sequential model, in which peer acceptance predicted academic achievement only in childhood, while

reciprocated friendship predicted academic achievement only in early adolescence. Not all hypothesized paths were significant in the parallel model, however, and this suggests that future studies should measure a broader range of peer experiences and use closer assessment points.

Keywords : academic achievement, friendship, longitudinal studies, peer relations, psychosocial development, school graduation, social acceptance, structural equation modeling, student engagement.

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Liste des sigles et abréviations

GRIP	Groupe de recherche sur l'inadaptation psychosociale chez l'enfant
SEM	S*tructural equation modeling* (modélisation par équations structurales)
SES	*Socioeconomic status* (statut socio-économique)
SBQ	*Social Behavior Questionnaire* (Questionnaire d'évaluation du comportement social)
PEI	*Pupil Evaluation Inventory* (Nom d'un questionnaire d'évaluation de l'élève par ses pairs)

Remerciements

Je suis profondément reconnaissante envers mon directeur de thèse, Frank Vitaro, dont la passion pour la recherche ainsi que les qualités professionnelles et humaines m'ont aidée à relever les nombreux défis propres aux études doctorales. Son soutien, sa constance, et sa confiance en moi ont été essentiels durant les dernières années. Il a contribué à renforcer chez moi de nombreuses valeurs comme l'honnêteté, la patience et l'humilité, et il a transformé mon attitude face à la recherche.

Les autres personnes dont la présence a été absolument essentielle au cours des dernières années sont mes collègues étudiants, ceux par qui je me suis sentie comprise et soutenue au cours des différentes étapes de mes études doctorales. Premièrement, mon ami Lamphone Phonevilay, qui s'est toujours rendu disponible pour m'encourager lorsque j'en avais besoin. Un grand merci à mes amies Rachel Boisjoli et Julie Vachon dont le soutien moral, et même la simple la présence au quotidien, m'ont beaucoup aidée à traverser les premières années de ce parcours académique. Je crois avoir réussi à devenir une meilleure personne grâce à « l'influence positive de mes pairs psychologues », et je leur en suis très reconnaissante. Je remercie également Nathalie Fontaine, Johanne Vézina, Sara Pedersen et Brigitte Wanner pour leur aide et leur support, ainsi que les autres étudiants de mon groupe de recherche et de mon département que j'ai apprécié de côtoyer. Merci au personnel du Groupe de recherche sur l'inadaptation psychosocial chez l'enfant (GRIP). Un très grand nombre de personnes ont contribué aux étapes préliminaires aux analyses présentées dans cette thèse. Ces personnes m'ont permis de travailler dans un milieu agréable et stimulant. J'aimerais souligner en particulier la contribution des chercheurs qui sont les coauteurs des articles de cette thèse, Mara Brendgen et Richard E. Tremblay. Je remercie également Antonio Zadra, professeur au Département de psychologie, qui m'a offert des expériences de travail extrêmement enrichissantes ainsi qu'un support concret dans plusieurs de mes projets académiques.

Pour terminer, j'aimerais souligner que ma famille a été le noyau de stabilité dans ma vie au cours des dernières années. Je remercie donc ma mère Marie-Josée, ma sœur Mireille, ma sœur Andrée-Anne (ainsi que ses enfants) et ma grand-mère Alfréda.

Introduction

Contexte théorique

L'obtention du diplôme d'études secondaires dans le contexte d'une société industrialisée telle que la nôtre est un événement déterminant, tant pour le diplômé lui-même que pour sa communauté. Les individus qui n'obtiennent pas ce diplôme courent un plus grand risque de risque de souffrir de problèmes d'ordre psychosocial, comme des difficultés à trouver un emploi et des pertes de revenu (Kerckhoff & Bell, 1998; Morissette & Johnson, 2004; Zeman, Knighton, & Bussière, 2004), et ils présentent généralement un niveau d'adaptation psychologique inférieur à celui des diplômés (Kaplan, Damphousse, & Kaplan, 1994). Un faible taux de diplomation entraîne aussi des conséquences financières et sociales pour l'ensemble de la communauté, étant donné les coûts reliés à l'aide financière pour les personnes sans emploi, ainsi que le manque d'engagement des individus non diplômés dans la vie communautaire et politique de leur société (McCaul, Donaldson Jr., Coladarci, & Davis, 1992).

Selon Statistique Canada (Bowlby & McMullen, 2005b), les personnes n'ayant toujours pas obtenu leur diplôme d'études secondaires entre l'âge de 20 et 24 ans ont très peu de chances de devenir diplômés. Durant l'année scolaire 2004-2005, 9,8% des Canadiens appartenant à ce groupe d'âge (7,2% des femmes et 12,2% des hommes) ne détenaient pas de diplôme d'études secondaires et n'étaient inscrits dans aucun programme scolaire dans le but de l'obtenir. Au Québec, la situation était encore plus critique puisque le taux moyen de non-diplomation parmi les personnes de ce même groupe d'âge s'élevait à 11,9% pour les années scolaires 2002-2003 à 2004-2005.

Afin de mieux comprendre les causes de l'abandon scolaire, plusieurs chercheurs ont tenté d'identifier ses précurseurs (voir les recensions de Ekstrom, Goertz, Pollack, & Rock, 1986; Janosz, Fallu, & Deniger, 2000; Jimerson, Egeland, Sroufe, & Carlson, 2000; Krohn, Thornberry, Collins-Hall, & Lizotte, 1995; Rumberger, 1987). Ainsi, divers facteurs d'ordre socio-culturel, familial et personnel se sont avérés associés à un plus haut risque d'abandonner l'école sans avoir obtenu de diplôme d'études secondaires. Parmi les facteurs socio-culturels et familiaux, la structure familiale, les relations avec les parents, le statut socioécomomique de la famille et les attentes des parents face à la poursuite des

études chez leur enfant se retrouvent en tête de liste. Divers facteurs individuels ont aussi été associés à l'abandon scolaire, comme de faibles attentes face à ses propres résultats scolaires et à ses chances de poursuivre des études plus avancées, un faible engagement et des attitudes négatives envers l'école, une faible estime de soi ainsi que la présence de troubles extériorisés.

En comparaison des facteurs socio-familiaux et individuels, les facteurs liés aux pairs semblent avoir été négligés (Hymel, Comfort, Schonert-Reichl, & McDougall, 1996; Rumberger, 1987; Vitaro, Larocque, Janosz, & Tremblay, 2001), même si diverses théories soulignent l'importance des expériences avec les pairs dans le développement cognitif et social des enfants (par exemple Furman & Robbins, 1985; Piaget, 1977; Sullivan, 1953; Vygotsky, 1978). Certains théoriciens ont même explicité comment des expériences négatives avec les pairs au cours des années d'études primaires et secondaires pouvaient contribuer à entraîner certains élèves vers l'abandon scolaire (Finn, 1989; Patterson et al., 1989). Il apparaît donc pertinent d'examiner empiriquement le rôle des pairs dans le processus menant à l'obtention d'un diplôme d'études secondaires, en raison des retombées théoriques et pratiques des résultats éventuels.

Présentation des articles de la thèse

Les trois articles inclus dans cette thèse aident à comprendre le rôle des pairs dans le processus menant à l'obtention du diplôme d'études secondaires en approfondissant chacun un aspect spécifique de la question. Les principaux objectifs poursuivis par ces articles et leur filiation conceptuelle sont décrits dans les prochains paragraphes afin de préciser leur fil conducteur et justifier leur ordre de présentation.

Article 1 « Social Experiences with Peers and High School Graduation: A Review of Theoretical and Empirical Research »

Il existe deux étapes préliminaires essentielles à la réalisation de toute recherche empirique. Premièrement, il est nécessaire de trouver des bases théoriques solides pour guider la conceptualisation de l'étude (en particulier lors de la formulation des hypothèses

et lors de l'interprétation des résultats). Deuxièmement, il faut recenser les travaux empiriques antérieurs portant sur le même thème de recherche afin de clarifier les enjeux théoriques et les questions non résolues.

Ce premier article répond à ces deux exigences, puisqu'il est à la fois un article théorique et un ouvrage de recension. La première partie de ce texte a une vocation théorique et décrit les différents types de modèles développementaux susceptibles de guider les études portant sur le rôle des pairs dans le processus d'adaptation psychosociale des enfants et des adolescents. Les modèles additif, interactif, controuvé et médiateur (incluant les sous-types séquentiel, parallèle, et bidirectionnel) y sont expliqués et comparés sur le plan de leur efficacité relative pour synthétiser les connaissances actuelles et en générer de nouvelles.

La deuxième partie de l'article comporte elle aussi un aspect théorique, puisqu'elle vise à explorer les divers aspects du concept d'expériences avec les pairs. Elle prend la forme d'une recension des écrits empiriques, ce qui permet en outre d'explorer le lien entre les différents types d'expériences avec les pairs et l'adaptation scolaire des élèves.

Enfin, la troisième partie de ce texte est de nature essentiellement théorique. À la lumière des études empiriques rapportées à la section précédente, elle présente un aperçu des principaux défis à relever dans les prochains efforts de recherche. Ce tour d'horizon des enjeux théoriques et méthodologiques s'est avéré très utile pour guider les deux études empiriques réalisées par la suite. Tout d'abord, il a mis en évidence la pertinence des études longitudinales à long terme commençant à l'âge préscolaire et se poursuivant jusqu'à l'âge adulte, afin de comprendre la chaîne développementale qui contribue à augmenter le risque de ne pas obtenir de diplôme chez certains élèves. Le modèle développemental de type médiateur-séquentiel s'est particulièrement imposé dans ce contexte comme un excellent guide pour ce type de recherche. Cette constatation a inspiré l'idée de base de l'article 2, qui vise à vérifier si le rejet par le groupe de pairs et l'association à des amis déviants durant la préadolescence font partie d'une chaîne développementale débutant à la maternelle et menant au statut de non-diplômé à 23 ans.

Par ailleurs, l'article 1 souligne que peu d'études ont vérifié l'existence de périodes critiques susceptibles d'exacerber le rôle de certains types d'expériences négatives avec les pairs. Pourtant, des hypothèses par rapport à des périodes critiques du développement ont été proposées il y a plus d'un demi-siècle par Sullivan (1953). L'article 1 souligne aussi l'importance d'explorer l'interface dynamique entre divers types d'expériences avec les pairs en regard de l'adaptation scolaire. En effet, selon la perspective de la psychopathologie développementale (Cicchetti, 1993), il est facilement concevable que les expériences avec les pairs (ex. le rejet par les pairs conventionnels) et l'adaptation scolaire des élèves (ex. le niveau de rendement scolaire) s'influencent mutuellement. Un test empirique de ces hypothèses a été mené dans le cadre de l'article 3, décrit ci-après.

Ma contribution comme première auteure de l'article 1 a été d'effectuer la recension des écrits, la rédaction de toutes les sections et les corrections demandées par l'éditeur de la revue où il a été soumis pour publication. Frank Vitaro, mon directeur de thèse, est coauteur de cet article, car il m'a guidée dans l'élaboration de la structure du texte et il m'a donné des commentaires sur les nombreuses versions de ce texte qui ont été écrites avant d'en arriver au produit final présenté ici. Cet article a été publié dans la revue *Educational Psychology* en juin 2007 (volume 27, numéro 3).

Article 2 « Do peers contribute to the likelihood of secondary school graduation among disadvantaged boys? »

L'article 2, qui est de nature empirique, a pour objectif de répondre à l'une des questions soulevées dans l'article 1, puisqu'il vise à vérifier si les expériences négatives avec les pairs au cours de la préadolescence jouent un rôle médiateur dans le cadre d'une chaîne développementale débutant avant même l'entrée à l'école et se terminant par l'obtention ou la non-obtention du diplôme d'études secondaires au début de l'âge adulte. Le but de cette étude est donc de contribuer à développer une vision à long terme du processus d'adaptation scolaire grâce à un plan de recherche longitudinal s'étendant sur 17 ans, élaboré selon un modèle développemental de type médiateur-séquentiel.

La chaîne développementale sous-jacente au modèle de type médiateur-séquentiel, qui a été mise à l'épreuve par des analyses d'équations structurales (SEM : *structural equation modeling*), a été élaborée en combinant deux perspectives théoriques complémentaires, soit le modèle socio-interactif (*social interactional perspective*) développé par Patterson et ses collègues (Patterson et al., 1989; Patterson, Forgatch, Yoerger, & Stoolmiler, 1998; Patterson, Reid, & Dishion, 1992) et le modèle « participation-identification » proposé par Finn (1989). Le lecteur est référé à l'article 2 pour connaître les détails des fondements théoriques de cette étude, la méthode employée, les résultats obtenus ainsi que l'interprétation de ces résultats.

Ma contribution comme première auteure de cet article a été d'effectuer les recherches documentaires pour développer le contexte théorique, de réaliser les analyses statistiques et de rédiger toutes les parties de ce manuscrit. Frank Vitaro, mon directeur de thèse, est le deuxième auteur de cet article, car il m'a suggéré des pistes pour la construction du contexte théorique, il m'a guidée dans l'élaboration des questions et hypothèses de recherche, et il m'a donné ses commentaires sur toutes les versions de ce manuscrit qui ont été élaborées avant d'en arriver au produit final présenté ici. Sara Pedersen, chercheuse postdoctorale au Groupe de recherche sur l'inadaptation psychosociale chez l'enfant (GRIP), est troisième auteure de cet article, car elle m'a guidée à travers la réalisation et l'interprétation des principales analyses statistiques présentées dans l'article. Enfin, Richard E. Tremblay, chercheur au GRIP, est le quatrième auteur parce qu'il a lancé le projet de recherche plus large ayant permis de générer les données utilisées pour réaliser cette étude (i.e., l'Étude longitudinale et expérimentale de Montréal).

L'article 2 a été accepté pour publication dans la revue *Journal of Educational Psychology*.

Article 3 « The contribution of peer acceptance and friendship to academic achievement in elementary school: Contrasting parallel and sequential mechanisms »

Deux autres questions soulevées dans l'article 1 sont au cœur de la conceptualisation de l'article 3, dont les principaux objectifs sont (a) de mettre à l'épreuve deux modèles qui incluent des liens réciproques entre les expériences avec les pairs et le rendement scolaire des élèves, et (b) de vérifier s'il existe des périodes critiques durant lesquelles une faible acceptation par les pairs ou encore un trop petit nombre d'amis réciproques pourraient avoir un impact particulièrement néfaste sur le rendement scolaire des élèves.

La vraisemblance de deux modèles transactionnels distincts a été comparée empiriquement à l'aide d'analyses SEM. D'une part, le modèle transactionnel séquentiel inspiré par la théorie interpersonnelle de Sullivan (1953) suggère que les liens réciproques entre l'acceptation par le groupe de pairs et le rendement scolaire des élèves devraient émerger durant les premières années d'études primaires, tandis que les liens réciproques entre le nombre d'amis réciproques et le rendement scolaire des élèves devraient émerger vers la fin des études primaires. Plusieurs recherches empiriques—notamment les travaux de Ladd et ses collègues (e.g., Ladd, Kochenderfer, & Coleman, 1997) et de Wentzel et Caldwell (1997)—suggèrent toutefois qu'un modèle transactionnel de type parallèle, dans lequel les deux types d'expériences avec les pairs pourraient jouer un rôle important tant à l'enfance qu'au début de l'adolescence, serait plus plausible. Les résultats de ce test comparatif des deux modèles de type transactionnel et autres détails méthodologiques sont présentés dans l'article 3.

Ma contribution comme première auteure de l'article 3 a été d'effectuer les recherches documentaires pour développer le contexte théorique de ce manuscrit, de réaliser les analyses statistiques et de rédiger toutes les parties de ce manuscrit. Frank Vitaro, mon directeur de thèse, est le deuxième auteur de cet article, car il m'a suggéré des pistes pour la formulation du contexte théorique, il m'a guidée dans l'élaboration des questions et hypothèses de recherche, et il m'a donné ses commentaires sur les versions de

ce texte qui ont été élaborées avant d'en arriver au produit final présenté ici. Mara Brendgen, chercheuse au GRIP, est troisième auteure, car elle m'a conseillée relativement aux analyses statistiques présentées dans l'article et m'a donné ses commentaires sur les versions de ce texte qui ont été élaborées avant d'en arriver au produit final présenté ici. Enfin, Richard E. Tremblay, chercheur et directeur du GRIP est le quatrième auteur parce qu'il a lancé le projet de recherche plus large ayant permis de générer les données utilisées pour réaliser cet article (i.e., l'Étude longitudinale des enfants de maternelle du Québec). Cet article sera bientôt soumis pour publication.

Prochaines sections de la thèse

Les trois prochains chapitres présentent respectivement le texte intégral des trois articles de thèse. Le dernier chapitre présente la conclusion générale de la thèse.

Article 1—Social Experiences with Peers and High School Graduation: A Review of Theoretical and Empirical Research

Par Marie-Hélène Véronneau et Frank Vitaro

Abstract

This article reviews theoretical and empirical work on the relation between child and adolescent peer experiences and high school graduation. First, the different developmental models that guide research in this domain will be explained. Then, descriptions of peer experiences at the group level (peer acceptance / rejection, victimization, and crowd affiliation) and at the dyadic level (friendship and clique membership) will be presented, together with their relation to graduation and other indicators of school adjustment. Finally, major theoretical issues and recommendations for future research will be discussed. Specifically, the necessity of including all relevant predictors and control variables in empirical studies and of dealing appropriately with time-related issues will be highlighted. Methodological challenges associated with these recommendations will also be explored.

Keywords: Peer relations, school graduation, literature review, theories, methodology.

Social Experiences with Peers and High School Graduation: A Review of Theoretical and Empirical Research

High school graduation is an event of utmost importance in today's industrialized societies, both for graduates and for their communities. Individuals who do not obtain a high school diploma are at greater risk for psychosocial problems, such as difficulty finding employment and loss of wages (Kerckhoff & Bell, 1998), as well as lower levels of psychological adjustment than graduates (Kaplan et al., 1994). In addition to a variety of personal and familial risk factors, researchers have acknowledged the role of peers in regard to school achievement and graduation (Hymel et al., 1996; Risi, Gerhardstein, & Kistner, 2003). This article is intended to critically review the actual knowledge and research issues regarding the relationship between peer experiences in childhood and adolescence and high school graduation. First, the different developmental models that guided empirical research in this domain will be explored. Next, empirical work on the link between peer experiences and high school achievement or graduation will be synthesized. Finally, higher-order issues that are likely to be central to future studies in this domain of research will be discussed.

Developmental Models

Woodward and Fergusson (2000) and Ladd and Troop-Gordon (2003) proposed four models intended to explain the impact of peer experiences on later adjustment. These models are illustrated in Figure 1.

In the causal *additive* model, peer experiences have a unique and direct impact on later adjustment, even when controlling for all other relevant predictors. In the *interactive* model (also known as the *moderator* or *multiplicative* model), peer relationships either buffer or exacerbate the effect of another predictor on future adjustment. It is noteworthy that the first two models are compatible with each other, as a variable may both have an

independent effect on the dependent variable and yet moderate the link between one or more other predictors and the outcome variable. The *incidental* or *spurious* model suggests that peer experiences are only by-products of pre-existing risk factors which are the true predictors of future adjustment. In other words, if difficult peer experiences and future maladjustment are both caused by the same risk factors, a correlation will emerge between the peer experiences and maladjustment, but negative peer experiences are only a marker, not a cause, of the negative outcomes. Finally, the causal *mediator* model suggests that psychosocial maladjustment in early adulthood is the product of a chain of developmental events in which difficult peer experiences during childhood and adolescence are caused by pre-existing risk factors. These peer experiences, in turn, cause other psychosocial difficulties which ultimately lead to more distal outcomes such as failure to graduate from high school. In other words, the mediator model assumes that early risk factors, such as disruptive behaviors, are linked to failure to graduate from high school at least partly through peer experiences.

The mediator model is the most complex, but also the most useful, because it may include not only mediating effects, but also direct additive effects and even moderating effects–thus yielding models of "moderated mediation" (Baron & Kenny, 1986), in which mediators operate under certain conditions and not others. There are many subtypes of mediator model. As shown in figure 2, the *sequential* model is the simplest subtype, as the different types of peer experiences are all part of the same chain of predictors. The *parallel* subtype is slightly more complex, although different peer experiences are simply separated along two pathways to the outcome. *Bidirectional* models (also known as *reciprocal*, *cross-lagged*, or *transactional* models), however, involve reciprocal effects among variables whereby two or more variables influence one another over time.

Mediator models have become popular in recent research into school graduation, as many researchers agree that failure to graduate from high school is one of the distal consequences of a deviant developmental trajectory that begins in early childhood.

Theoretical explanations belonging to this perspective will be presented throughout the next section to clarify the role of different types of peer experiences.

Overview of Peer Experiences and of their Relation to High School Graduation

When designing a developmental model to be tested in empirical research, it is important to have a clear understanding of its central variables. Hence, the current section defines the main types of peer experiences that are included in studies based on work done since the second half of the twentieth century.

The interpersonal theory developed by Harry Stack Sullivan (1953) has had a strong influence on the study of child and adolescent peer experiences. Sullivan emphasized that children and adolescents encounter different types of peer experiences, and that the relative importance of such experiences varies across development along with normative changes in children's psychological needs and cognitive abilities. Two general types of peer experiences have emerged from this theory and represent a useful classification scheme for peer relationships: group-level experiences and dyadic experiences. This section is organized according to this division, and presents the work of other influential theorists who thereafter contributed to refining the conceptualization of peer experiences.

Peer Experiences at the Group Level

According to Sullivan (1953), children are confronted with their first extensive socialization experiences outside of their family when they enter elementary school. Therefore, acceptance in the peer group is a primary concern of children in the early school years—a concern that never completely disappears, according to Buhrmester and Furman (1986), even when additional social needs emerge. As a result, children try to abide by peer group norms in order to avoid the anxiety and low self-esteem provoked by peer

group rejection. Involvement with the peer group brings about the development of a range of basic social skills such as cooperation, good communication, compromise, and fair competition, which are crucial to achieve successful outcomes at further stages of interpersonal development. Other theorists expanded on Sullivan's work, associating additional benefits with high peer status, such as having access to a larger number of potential collaborators when one needs instrumental aid (Furman & Robbins, 1985), and satisfaction of the need for group inclusion or social connectedness (R. M. Ryan & Deci, 2000).

Conversely, these theories suggest that children who do not possess the social or cognitive skills necessary to gain acceptance by peers, and who do not succeed in learning these skills by observing more popular peers, are excluded from the peer group; many feel ostracized and lonely, and most become increasingly behind in the development of their social skills.

The hypothesized consequences of early experiences with the peer group on socio-cognitive adjustment inspired several researchers to test for potential relationships between peer experiences at the peer group level and high school graduation or its precursors. Although the long-lasting concepts of peer acceptance / rejection have received much deserved attention, other peer group experiences have also been examined, namely victimization and crowd membership. These three group-based peer experiences (i.e., acceptance / rejection, victimization, and crowd membership) are reviewed below in turn.

Peer acceptance / rejection. The definition of peer acceptance has not changed much since the publication of Sullivan's work, but its definition is certainly more precise. It is nowadays acknowledged that acceptance and rejection by peers represent two separate dimensions of popularity and integration within the peer group (Bukowski, Sippola, Hoza, & Newcomb, 2000). Acceptance is defined by positive affects combined with the desire to be with the individual. In contrast, rejection is defined by negative affects combined with the desire to stay away from the individual. Ratings of peer acceptance and rejection,

usually measured through peer reports, can take the form of either continuous scales or categorical sociometric status (popular, average, controversial, neglected, and rejected). Categorical measures are advantageous because they reflect not only children's social preference (just like continuous measures), but also their level of social visibility or social impact (i.e., the intensity of peers' reactions toward the child). However, continuous scales are more flexible with regard to data analysis.

It is reasonable to hypothesize that all individuals exhibiting problematic patterns of group integration—namely those who belong to the rejected, neglected, and controversial categories, or those who score high on peer rejection and low on peer acceptance—could be at heightened risk of not graduating from high school or of presenting adjustment problems earlier in their schooling. One study that partly supports this hypothesis (O'Neil, Welsh, Parke, Wang, & Strand, 1997) showed that children who were rejected or neglected in kindergarten had lower marks than popular children when they were in the first and second grades. This finding held even when controlling for the child's initial level of cognitive aptitude. However, rejected and neglected children did not have significantly lower marks than average children. In other research done with children (Hatzichristou & Hopf, 1996) and adolescents (Frentz, Gresham, & Elliott, 1991; Hatzichristou & Hopf), popular students obtained higher scores of academic achievement than their peers who were not popular, and rejected students had the lowest achievement scores. No consistent differences emerged between average students and their neglected and controversial counterparts. A study of early adolescents revealed gender differences in the school grades obtained by controversial and neglected children (Wentzel, 2003). Whereas male controversial and neglected students had lower grade-point averages than average students, the opposite was true of girls—controversial and neglected female students had higher grade-point averages than average students.

Longer-term studies have revealed that rejected and controversial students (Ollendick, Weist, Borden, & Greene, 1992), or those having low social preference scores

(Coie, Lochman, Terry, & Hyman, 1992) were more likely to fail a school year. Low-accepted children had more adjustment problems in secondary school (Coie et al., 1992), and rejected students had more academic problems on a global scale measuring truancy, grade retention, school dropout, police contact and suspension from school (Kupersmidt & Coie, 1990). Rejected students were also at higher risk of school dropout before the ninth grade than were other students (Ollendick et al., 1992).

Some authors have further nuanced the social acceptance / peer rejection constructs by distinguishing between the preference-based measures of peer acceptance (derived from sociometric nominations) and the popularity-based measures (derived from peer-perceived popularity nominations) (Parkhurst & Hopmeyer, 1998). Interestingly, when students are asked to nominate students they perceive as popular and those they perceive as unpopular (thereby paralleling the bidimensional structure of standard sociometric measures), perceived popularity and sociometric popularity are significantly related in early adolescents, but unrelated in middle adolescents (Kosir & Pecjak, 2005). Since both peer-perceived and preference-based popularity are related to positive attitudes towards school and good relationships with peers and teachers in adolescents (Kosir & Pecjak), both types of popular students could be more likely than other students to graduate from high school.

Some critiques have emerged from the developmental psychopathology perspective: some authors have called attention to the potential problems that could arise from treating peer acceptance as a stable variable (Coie & Dodge, 1983), or from assuming that its relationship with academic performance or school dropout remains the same across time (Coie, 1990). In fact, sociometric status may fluctuate—for instance, some children experience transitory peer rejection whereas others experience chronic rejection (Coie & Dodge). Although chronic rejection is associated with higher risk of adjustment problems in general, including lower social competence, internalization problems, and aggressive behavior (Burks, Dodge, & Price, 1995; Parke et al., 1997; Vitaro, Tremblay, Gagnon, & Boivin, 1992), this finding does not hold for academic outcomes. In fact, short- and

medium-term studies with grade school and kindergarten children have revealed that occasionally rejected students are not significantly better adjusted than chronically rejected students with respect to academic achievement, academic skills, or rates of absenteeism (DeRosier, Kupersmidt, & Patterson, 1994; Ladd & Burgess, 2001; Pettit, Clawson, Dodge, & Bates, 1996) .

The similarities between chronically and transitorily rejected children with respect to school outcomes, however, may have resulted from low power due to small sample size and to insufficient data points. In consequence, more empirical studies are needed to clarify the long-term effects of occasional versus chronic peer rejection with respect to academic functioning and school orientation.

Several hypothetical pathways from such peer experiences to high school graduation can be proposed from existing theoretical work on the role of peer acceptance / rejection. First, failure to satisfy the need for social connectedness and the resulting feeling of social exclusion (Furman & Robbins, 1985; R. M. Ryan & Deci, 2000) could, in theory, mediate the relationship between low peer acceptance and the failure to graduate, as youth who experience feelings of social exclusion may feel lonely and bored at school, and consequently lose interest in attending. Second, popular students might have easier access to instrumental academic aid from the most competent members of the peer group, as suggested by Furman and Robbins (1985). This aid, in turn, could have a positive effect on school achievement from the earliest years of schooling. Third, the general state of psychological well-being arising from positive experiences with the peer group (i.e., reduced anxiety, positive self-esteem, enjoyment of social activities, a supportive social network) could contribute to positive attitudes toward school, ensuring that school is a place where well-accepted students like to be, as suggested by R. M. Ryan and Deci (2000). These positive attitudes might lead to reduced absenteeism and a lower risk of school dropout. Whatever developmental pathway rejected and low-accepted students take during their later elementary and secondary school years, a study by Ladd (1983) suggests

that everyday peer interactions in their early years of schooling are less likely to provide positive socialization experiences for them than for their nonrejected peers. Their interactions are characterized by more rough-and-tumble play in boys and by more unoccupied behavior and parallel play in girls. They also display less cooperative play than their popular or average peers, and they play in smaller groups, with younger and less popular children.

Despite the usefulness of the acceptance / rejection construct, some children may suffer less from their low social status than others. In fact, some may not be aware of their low popularity because other children do not manifest their feelings towards them due to fear of retaliation. In contrast, others may be actively victimized by peers. Hence, victimization can be seen as a specific type of negative peer experience that combines both a group and a dyadic aspect, as discussed next.

Peer victimization. Victimization (Olweus, 1993) can be conceptualized as a group-based phenomenon (Salmivalli, Lagerspetz, Bjorkqvist, Osterman, & Kaukiainen, 1996), for it is often preceded by low peer acceptance and perpetuated through encouragement or apparent indifference from other children. Because of its structural organization, the school environment may facilitate the occurrence of victimization. When a large number of children or adolescents are supervised by only a few adults, some youngsters have the opportunity to engage in repetitive patterns of physical, verbal, or social aggression towards defenseless peers.

Research into peer victimization and harassment has lent some support to Olweus's (1993) suggestion that victims have lower school adjustment than their peers across a wide range of developmental periods. Ladd, Kochenderfer, and Coleman (1997) found negative relations between self-reported victimization and school affect, school liking, and school performance in kindergarteners, even when controlling for number of friends and peer acceptance. In early adolescence, self-perceived peer harassment was negatively associated with school adjustment, and this relation was mediated by such variables as lower levels of

psychological adjustment (Juvonen, Nishina, & Graham, 2000), weaker school attachment, and inattentive school behaviors (Wei & Williams, 2004). Peer victimization may also play a role in a mediator model, as peer rejection might be a precursor of victimization. As victimization is associated with feelings of loneliness and dysphoria (Boivin, Hymel, & Hodges, 2001), it may precipitate lower school motivation and dropout.

Crowd affiliation. Another type of peer experience that emerges from group phenomena is assimilation into a crowd. Brown (1990) defined crowds as groups of individuals sharing a set of social characteristics (e.g. activities, clothing, interests, attitudes, social status within the peer group, or level of social competence). Examples of crowd labels that can be found in schools are: the popular kids, the jocks, and the brains. Brown explained that crowd membership is based on the individual's reputation, which in turn is reinforced by crowd membership. Although students' behaviors and characteristics influence their crowd membership, they cannot decide by themselves to be assigned to a particular crowd. Like sociometric status, crowd assignment emerges from a global peer group evaluation of the individual. Crowds are perceived by youngsters as most important around middle adolescence (Dunphy, 1963).

Crowd membership could serve various purposes, such as facilitating adolescents' access to social activities and to emotional support, offering opportunities to socialize with opposite-sex peers, contributing to identity formation, or improving social status within the peer group. Conversely, undesired crowd assignment may have negative consequences, such as an unwanted reputation or the prohibition of access to other crowds (Brown, Eicher, & Petrie, 1986).

In comparison with other group-level peer experiences, very little is known about the impact of crowd membership on school achievement or graduation. One study by Steinberg, Dornbusch, and Brown (1992) suggests that African-American students tend to have lower academic achievement than European-American students because it is harder for African-American youth to find and to identify with a crowd of students of their own

ethnic group who encourage and reinforce high academic achievement. Similarly, the higher academic achievement in Asian-American students could be explained by the prominence of crowds of studious students among this ethnic group. However, it is important to keep in mind, as suggested by Brown and Huang (1995), that students are not influenced exclusively by their peers, for parents' attitudes and behaviors may moderate or compensate for crowd influence.

To conclude, the psychological benefits of positive experiences within the peer group in childhood and adolescence has been illustrated by several studies. However, when testing for developmental pathways towards high school graduation, the effect of peer experiences at the group level cannot be fully understood without accounting for peer experiences at the dyadic level. Therefore, this topic will be introduced next.

Peer Experiences at the Dyadic Level

Sullivan's (1953) interpersonal theory suggests that dyadic experiences gain importance in preadolescence—the developmental period starting halfway through the elementary school years and ending when children enter puberty—because this period brings about the need for intimacy. While children seek peer contact to satisfy their needs for social acceptance and companionship, preadolescents long for a deep and reciprocated relationship with a same-sex, same-age friend (a "chum") with whom they can share intimate thoughts and feelings.

Just as with peer group experiences, later authors qualified this perspective by widening the period during which dyadic experiences are considered as developmentally significant. Some argue that friends remain significant throughout the adolescent period, supporting one another in the face of new developmental challenges (Berndt & Perry, 1990; Buhrmester, 1996), and others showed that close and reciprocated friendships can contribute to psychological and academic adjustment by the early elementary school years (Ladd & Kochenderfer, 1996; Ladd et al., 1997). However, younger children tend to value

their friends mainly for their companionship and instrumental aid, whereas during adolescence, more abstract functions such as intimacy and commitment are added to these pre-existing functions (Furman & Bierman, 1984).

Defining friendship. The definitions of friendship given by several theorists thereafter remained in essence very similar to Sullivan's (1953). For instance, Parker, Rubin, Price, and DeRosier (1995) and Rubin, Bukowski, and Parker (1998) state that all friendships share three basic characteristics: the reciprocity of the relationship, the voluntary association of the protagonists, and the satisfaction of socio-affective needs (rather than instrumental needs) as the primary basis of the relationship. Other constructs have been proposed as fundamental elements of friendship, such as the presence of feelings like attachment, love, or affection (Rubin et al., 1998). In contrast, Newcomb and Bagwell (1995) suggest that friendship is based on two dimensions—knowing and liking—and they do not consider reciprocity an essential element of friendship. Hartup (1996) went further than simply suggesting a set of characteristics that are common to all friendships. Acknowledging that all friendships are not equally valuable, he proposed three dimensions that allow researchers to study differences among friendships.

The first dimension, "having friends", is useful inasmuch as it highlights the importance of relying on some objective criteria to establish whether an individual has at least one reciprocated friend. Few longitudinal studies have assessed the long-term impact of friendlessness on academic variables. However, some researchers have examined the short-term impact of having one or many friends on school achievement. For example, Ladd (1990) found that kindergartners who made a greater number of new friends over the school year had better school results by the end of the year. Among sixth graders, having at least one reciprocated friend was concurrently associated with higher grade point averages (Wentzel, Barry, & Caldwell, 2004). In contrast with childhood, the relationship between number of friends and school achievement is not as clear during adolescence. In one study (Janosz, Le Blanc, Boulerice, & Tremblay, 2000), dropouts were found to have as many, if

not more, friends than high school graduates, although it is not clear from this study whether or not these friends were reciprocated. The ambiguity of the results concerning friendlessness and psychosocial adjustment in adolescents suggests that the benefits of friendship may be moderated by the friends' characteristics and friendship quality—the second and third dimensions described by Hartup (1996).

The second dimension, "the identity of one's friends", refers to the personal characteristics of friends. In this particular field of study, incidental models can be pitted against causal mediator models[1]. While those who hold to causal models propose that similarities between friends can be explained by a process of mutual influence on one another's behaviors and attitudes (i.e., socialization effects), subscribers to the incidental model suggest, instead, that such similarities stem from students' initial attraction toward peers that resemble them (i.e., selection effects). Kandel's (1978) socialization hypothesis—that friends tend to influence one another on positive, but also negative, school-related behaviors—was supported by Berndt and Keefe (1995) and by Mounts and Steinberg (1995) in different samples of adolescents.

However, more attention should be devoted to research questions that lie within the framework of mediator models, targeting the processes through which friends influence one another. Several hypotheses may be formulated regarding how friends may exert their influence. Given that participation in extracurricular activities correlates with school engagement (see review by Valentine, Cooper, Bettencourt, & DuBois, 2002), having friends who take part in such activities might prompt students to participate as well. This would, in turn, enhance their school commitment. Conversely, having friends who are not interested in school may lead to lower academic achievement, as deviant adolescents may encourage their friends to engage in activities that are incompatible with academic learning and achievement, including substance use or delinquent behaviors. The transmission of deviant norms and behaviors among friends may be facilitated by a lack of communication among social agents (school staff, family, and friends) (Elliott et al., 1996). In contrast,

academically-oriented peers who spend their free time studying or engaging in structured, adult-supervised activities benefit from the protection of their strong social capital.

Overall, research on friends' characteristics as they relate to high school graduation must be interpreted with caution. This is because studies usually do not assess the impact of friends' characteristics on long-term academic outcomes like school graduation, and because in most cases researchers did not seek to establish whether the relationship described by the participants was a friendship according to such objective criteria as reciprocity or equality in power.

Finally, the third dimension discussed by Hartup (1996) is "friendship quality"—the extent to which a friend contributes to the satisfaction of one's socio-affective needs. Some theorists contend that high-quality friendships simply have higher levels of those basic provisions common to all friendships (e.g., Bukowski, Hoza, & Boivin, 1994). For example, although all friendships provide some levels of security and intimacy, some relationships may provide more than others. Other researchers, however, suggest that secondary characteristics of the relationship (which are not basic provisions of friendship) may also contribute to friendship quality. For example, conflicts may occur between good friends, so a complete lack of conflict is not a primary definitional criterion of friendship. Nevertheless, frequent or intense conflicts may be one aspect of friendship that affects its quality (Ladd, Kochenderfer, & Coleman, 1996; Parker & Asher, 1993a).

Empirically, several aspects of friendship quality have been related to academic performance in children and adolescents. In a kindergarten sample, Ladd et al. (1996) found that help and validation from friends were associated with an increase in children's positive attitudes towards school between the beginning and the end of the school year. In contrast, conflicts with friends impeded school adjustment. Similarly, in an adolescent sample there was a correlation between perceived friend support and several measures of school adjustment, such as academic motivation, engagement in academic and social activities at school, and school grades (Kurdek & Sinclair, 1988). Conversely, friendship

negativity—as perceived by one or both partners of a friendship dyad—was associated with lower school grades (Burk & Laursen, 2005). A prospective study by Berndt and Keefe (1995) showed that students who felt supported by their friends became more engaged in their studies over time, whereas youth whose friendships were affected by conflicts and rivalry became increasingly disruptive in class. Azmitia and Cooper (2001) found a steeper decline in school grades for students who did not have access to emotional and academic guidance from their peers at the time of junior high school entrance.

However, Berndt (1989), who found a correlation between friendship stability and psychological adjustment following the transition to secondary school, argues that third-variable (spurious) effects can hardly be dismissed (see Berndt, Hawkins, & Jiao, 1999). For example, the ability of socially skilled students to adapt to a new situation, rather than the positive effect of stable friendships, might explain the apparent effect of friendship quality. Other researchers found that the link between social support from friends in early adolescence and school performance two years later was not significant after controlling for stress, other sources of social support, and initial levels of school performance (DuBois, Felner, Brand, Adan, & Evans, 1992).

Paradoxically, friendships that appear to be high in quality may sometimes be correlated with negative outcomes if the friends' deviant characteristics offset the positive contribution of high-quality friendships (Berndt, 1999). For example, Le Blanc, Janosz, and Langelier-Biron (1993) reported that, compared to graduates, dropouts spent more time with their friends, to whom they were more loyal and more attached. Likewise, Mechanic (1983) contended that intimate friendships in adolescence are beneficial only when friends are a source of companionship and distraction. Conversely, when self-disclosure and introspection are central features of a close friendship, this may lead to the emergence of rumination, which can affect adolescents' psychological well-being (Rose, 2002), and possibly school performance.

Finally, it should be noted that the last two dimensions (i.e., the identity of one's friends and friendship quality) are probably not independent. Dishion, Andrews, and Crosby (1995) suggest that friendships among aggressive or deviant peers are not as satisfying as those existing between normative youth, perhaps because of negative interactions among deviant peers or because these friendships have emerged among individuals who have difficulty making friends with conventional peers. Also, certain qualitative aspects of the relationship might moderate a friend's influence. For example, Berndt, Laychak, and Park (1990) found that harmonious interactions enhanced reciprocal influence, whereas aggressive interactions had the opposite effect.

Functions of friendships. Research investigating friendship as it relates to academic or psychological adjustment assumes that the different aspects of the friendship experience, described in the previous section, somehow contribute to shaping the intellectual, social, and affective development of children and adolescents. Different theorists hold complementary views of the process underlying the psychological growth that emerges from interactions between same-age peers and friends which, in due course, contributes to their academic success.

In his interpersonal theory framework, Sullivan (1953) stated that preadolescent friendship serves two main functions. First, the secure social climate of this relationship allows preadolescents to receive honest feedback and validation of their self-worth. Second, it contributes to the development of higher-order social skills, such as empathy and caring. These functions were acknowledged and extended by later theorists. Notably, age distinctions were drawn between children, who tend to value their friends mainly for their companionship and instrumental aid, and adolescents, for whom friendships fulfill more abstract functions, such as intimacy and commitment, in addition to the pre-existing functions (Furman & Bierman, 1984). The contribution of friendship to additional higher-order social skills has also been proposed. These include compassion, altruism, loyalty, perspective-taking, the capacity to inhibit feelings of insecurity that might impede self-

disclosure (Buhrmester & Furman, 1986), and the capacity to initiate interactions, to provide emotional support, to express disagreement, and to manage conflicts (Buhrmester, 1996; Newcomb & Bagwell, 1995). In support of this, Parker and Asher (1993b) showed that having at least one friend is related to children's self-esteem and social competence.

Sullivan (1953) also suggested that children who were not well integrated into their peer group may find that "chumships" offer a second chance to develop the elementary social skills that most children acquire earlier in childhood through their interactions with the larger peer group. This is consistent with later assertions that self-expression, cooperation, and sense of equity can be developed within dyadic relationships (Hartup & Sancilio, 1986; Newcomb & Bagwell, 1995; Piaget, 1978). However, current theoretical models suggest that, for many children, difficulties at the peer group level are ingrained in deeper psychosocial problems which are unlikely to be overcome in later friendships. For instance, in the social interactional model of delinquency (a sequential, mediational model described by Patterson et al., 1992), it is hypothesized that coercive and inconsistent family practices encourage the development of cognitive biases (e.g., hostile attribution bias). This would lead in turn to deviant behavior patterns (e.g., aggression) that are usually reinforced through reciprocal processes both inside and outside the family rather than modified by interactions with peers and teachers (Dodge & Pettit, 2003). Deviant behaviors lead to problematic interactions with peers that prohibit peer group acceptance and the formation of friendships with normative peers. Empirical research has shown that such problematic behaviors foster affiliation with deviant friends (Boivin & Vitaro, 1995; Dishion, Patterson, Stoolmiller, & Skinner, 1991) who, in turn, support these deviant behaviors and possibly other activities that are antagonistic to school achievement. The association with a clique of deviant peers by adolescence is therefore more common than suggested by Sullivan, who apparently overlooked the importance of social experiences in early childhood in shaping cognitive schemata and future behavior.

As a whole, these theorists point to the importance of friendships in the development of social-cognitive skills which help achieve success in social settings such as school. In fact, effective interactions with peers and significant adults (i.e., parents, teachers, tutors, or school principals) help students take full advantage of the human resources that are available to them and develop a strong social network to support them in times of stress and adversity. From a complementary perspective, it has been argued that dyadic experiences contribute to the development of the cognitive and intellectual abilities necessary for academic performance and high school graduation.

As mentioned by Rogoff (1990), the contribution of Piaget and Vygotsky to this theoretical perspective is crucial. In the first place, according to Piaget (1975), children's understanding of the world is progressively brought to its adult "formal operational" stage as the cognitive schemes that serve to organize their knowledge of the world are refined when children's observations of the world do not fit with their current understanding of it. This conflict between observation and understanding is called disequilibrium. The resolution of disequilibrium is called adaptation. Interaction with a peer may allow greater cognitive advances because two children may offer different interpretations of reality (e.g., different solutions to a problem-solving task). The socially-driven cognitive conflicts that arise from interactions between peers may precipitate the questioning of one's cognitive schemes. The interaction that occurs between the two protagonists as they search for a solution enhances each child's progression towards a more advanced stage of reasoning. This active questioning and searching is not as efficient when the child is working with an adult. An adult is perceived by the child as an authority figure and is assumed to be right. Thus, less conflict arises from adult-child interactions. Piaget's hypotheses about peers' contribution to cognitive development have been supported by experimental research (Doise, Mugny, & Perret-Clermont, 1975).

In an effort to integrate social constructivism (Piaget, 1975) and social learning theory (Bandura, 1977), Vygotsky (1978) suggested that more cognitively advanced peers

may also aid the cognitive development of children. According to Vygotsky, children and adolescents may bring less advanced peers to work within their zone of proximal development, thus allowing the less advanced peers to succeed in tasks that are slightly too difficult for them, but that can be done with the guidance of a "tutor". Children need not be of different ages to act as tutors: they may take turns in the tutor role as their level of cognitive development may differ for different types of tasks. In this context, both modeling and social cognitive conflicts may be operating together.

Friendship experiences in childhood and adolescence are evidently very rich and complex. Another level of complexity emerges from the fact that friendships often evolve within a small group of friends rather than in the context of an isolated dyad. It is thus important to take a more global stance and to evaluate how these small groups, referred to as a "cliques", might influence students' academic development.

Cliques. The main criterion of clique membership is the intimacy of the relationships between one individual and the other clique members (Brown, 1990). In contrast with crowds or peer acceptance / rejection, cliques do not spontaneously emerge out of group-level phenomena; rather, associating with a clique is voluntary (Parker et al., 1995). The fact that cliques seem to emerge out of pre-existing friendships as extensions of dyadic experiences justifies treating them as a dyadic phenomenon, although they are on the edge of peer group experiences.

These groupings of close, usually same-sex friends emerge in middle childhood, but they become more common and are perceived as more important in early adolescence. During adolescence, one out of two youths says that he or she belongs to a clique (Crockett, Losoff, & Peterson, 1984). Later in adolescence, norms relating to clique membership become less rigid; many individuals belong to more than one clique (Shrum & Cheek, 1987) and heterosexual cliques begin to emerge in late adolescence (Dunphy, 1963).

The above-mentioned idea that friends' characteristics may be related to students' academic achievement and attitudes because of selection effects (incidental model) or socialization effects (mediator model) has also been explored in the context of cliques. Several traits of clique members, such as school motivation and performance (Delgado-Gaitan, 1996; Kindermann, McCollam, & Gibson, 1996; A. M. Ryan, 2001), deviant activities (Deater-Deckard, 2001), and future dropout status (R. B. Cairns, Cairns, & Neckerman, 1989) were assessed for that purpose. Most empirical studies suggest that both selection and socialization processes play a role in explaining the similar levels of school motivation (Kindermann et al., 1996; A. M. Ryan, 2001) and academic adjustment (Berndt & Keefe, 1995) within a clique, although Delgado-Gaitan (1996) contends that fluctuations in levels of motivation lead students to switch to cliques in which the general level of academic motivation is more similar to their own (a selection effect).

A different set of studies examined students' clique-related status, and they suggest that stronger network embedment is related to higher academic achievement. For example, in a study by Nichols and White (2001), clique members had higher algebra grades than nonmembers in both regular-track and high-track classrooms. Similarly, social network analysis on a sample of eighth-grade Chinese students revealed that clique members had levels of higher academic achievement than members of reciprocated dyads, and members of these dyads performed better than isolates (Liu & Chen, 2003). Still, being a clique member probably requires more social and social-cognitive skills than simply maintaining dyadic relationships, as intertwined relationships are more complicated to manage (Gifford-Smith & Brownell, 2003). Therefore, future research should verify whether better school adjustment is attributable to clique membership or to students' higher social and cognitive competence. Still, clique members' characteristics may moderate the apparent positive effect of belonging to a clique, as was explained in the previous section on friends' characteristics.

In summary, the impact of dyadic experiences on high school graduation is not easy to study, as it is likely to be moderated by the characteristics of friends or clique members, by the quality of the friendship, and by clique-related status.

Current Issues and Directions for Future Research

In the previous section, some theoretical and empirical questions concerning specific categories of peer experiences were raised and briefly discussed. However, there exists a variety of higher-level questions that are not limited to any specific type of peer experience. Since these are likely to have a strong influence on future investigations in this field of research, they will be outlined in this section. Some of these issues entail considerable methodological challenges, which will also be discussed.

Building Complete Models with Appropriate Variables

One central rule of scientific methodology for non-experimental studies is that measures of all relevant predictors and all potentially confounding variables should be included in the model to be tested, at least as control variables, in order to reduce the risk of model misspecification. This should be done no matter which developmental model is to be followed, as it minimizes the risk of mistakenly interpreting spurious effects as causal relations between the independent and the dependent variable. The possible existence of spurious effects of peer experiences was clearly demonstrated in a study by Wentzel and Caldwell (1997), who found that clique membership in the sixth grade was a significant predictor of academic achievement in boys and girls, as were peer group acceptance and reciprocated friendship (although in a less consistent manner), as long as no control variables were included in the model. However, after the inclusion of control variables, peer experiences in the sixth grade were no longer significant predictors of academic achievement in the eighth grade.

However, when reviewing studies on the role of peer experiences in the context of school achievement and high school graduation, it appears that this rule is not always followed. This could be due to limited resources (e.g., a small number of participants may make it necessary to select only a few control variables in order to preserve the required power in the analysis; similarly, limited time may prevent the administration of all desired measures). It might also occur because the previous theoretical and empirical work on which these studies were based did not provide a reasonable set of potentially confounding variables.

At first glance, it may seem difficult to select the most appropriate control variables ffrom all the possible candidates. In fact, an overwhelming number of possible causes for failure to graduate from high school have been identified, including immutable demographic variables (sex, ethnicity, family socioeconomic status), individual characteristics (academic aptitude, problem behavior) and psychosocial variables (school climate, relationships with school staff) (Rumberger, 1987). Fortunately, theoretical models have been developed that can help researchers choose the most relevant control variables (e.g., Battin-Pearson et al., 2000; Coie, 2004; Finn, 1989; Tinto, 1975).

Controlling for the effect of potentially confounding variables is usually a simple and appropriate way of conducting valid research in studies based on both simple and complex developmental models. Some researchers working with interactive models have gone a step further, addressing this problem by examining interaction effects between peer experiences and other important variables with respect to school outcomes. For example, several studies have shown that rejected children with aggressive or antisocial behaviors are at greater risk for school or social problems and internalizing or externalizing symptoms than children who are only aggressive or only rejected (Bierman & Wargo, 1995; Coie et al., 1992; Doran C. French, Conrad, & Turner, 1995). The authors of these studies thus considered peer rejection as a potential moderator of the link between early characteristics and later school problems, in line with an interactive model.

It is also important to consider the parallel, sequential, or bidirectional effects of distinct types of peer experiences (as illustrated in Figure 2), since these experiences are hypothesized to play different roles in child and adolescent development. However, it is surprising to see that including several types of peer experiences within the same study has been very uncommon up to now. Gifford-Smith and Brownell (2003) provide useful advice for future research that seeks to remedy this limitation, suggesting that independent methods be used for measuring the different types of peer experience in order to minimize problems arising from overlapping measures, such as shared method variance.

To conclude, working with incomplete theoretical models when doing empirical research may have negative consequences on theoretical advances in this field of study: it may lead to an incomplete understanding of the processes leading to school graduation. In addition, neglecting crucial variables can also have major practical consequences, for such models are used to design intervention programs. If erroneous beliefs about the risk factors (reflected in main effects) and protective factors (reflected in interactive effects) linked to a specific problem are used to develop intervention programs, these may prove to be inefficient (Furman & Robbins, 1985), resulting in a waste of economic and human resources.

Time-Related Issues

Time-related issues are intrinsic to the current topic. The fact that peer experiences are ongoing in students' lives from the first day of schooling until they leave school, and the fact that school graduation (or school dropout) occurs long after the first peer experiences have taken place, make it necessary for researchers to deal with time-related issues, whatever study design they adopt.

Actually, most longitudinal studies only span a few years. Thus, precursors of school completion (e.g., school grades, absenteeism, or attitude towards schooling) have often been used instead of the true outcome (i.e., high school graduation). Even assessing

very closely related constructs, such as dropping out of high school, is not truly equivalent. For instance, dropping out of school can occur at a relatively early age (i.e., 15 years) or later (i.e., 17 years), and as shown by Vitaro, Larocque, Janosz, and Tremblay (2001), different predictors may be linked to early versus late school dropout. In addition, many dropouts return to school, improving their chances of finding a stable, well-paid job or entering a post-secondary education program. Future research should therefore begin as early as possible and students should be followed beyond the age at which they normally graduate from high school. This will avoid including returning students in the at-risk group of nongraduates, and will correctly assign students who will never graduate despite being in school at later ages to the group of nongraduates.

It is also important to consider timing (or the age of participants) when formulating research hypotheses. In fact, as suggested by Sullivan (1953), being rejected by peers in the early grades, at the time when children have to find their place within a new social environment, may be more detrimental than experiencing peer rejection later on. Similarly, difficulties in dyadic relationships may have a greater impact if they occur in preadolescence or early adolescence (rather than in childhood), when emotional autonomy from parents begins to develop through close friendships and clique membership. Thus, the psychological advances that characterize the childhood and adolescent years warrant special attention to the timing variable. In line with this, Véronneau, Vitaro, Wanner, and Tremblay (2004) found that popularity at ages 11 and 12 was a significant predictor of high school graduation, after controlling for socioeconomic status, participants' own level of disruptiveness, and irregular academic curriculum, while the number of reciprocated friends and friends' disruptiveness emerged as additional predictors at age 12 only.

In addition, the duration (or chronicity) issue that was raised with regard to peer rejection should be extended to all types of peer experience. Just as chronic rejection has been suggested to be more detrimental to long-term academic adjustment than transient

peer rejection, the duration of a high quality friendship or the chronicity of membership of deviant cliques, for example, may moderate the hypothesized effects of such experiences.

To accommodate these time-related issues, we suggest one particular subtype of mediator model, namely the bidirectional model (see Figure 2). In fact, it is now recognized that developmental models that include variables only at one single point in time (such as the additive model) may lack subtlety inasmuch as many types of life experience are not time-limited but ongoing, and their roles may differ at different developmental periods. The links may be bidirectional, such that the "independent variable" (i.e., peer experiences) might also be influenced by the "dependent variable" (i.e., academic achievement). Longitudinal bidirectional (or transactional) models allow us to operationalize such complex reciprocal relationships over time and may guide future studies designed to assess whether fluctuations in peer difficulties can be caused, at least in part, by changes in academic performance. A first step in this direction was accomplished by Welsh, Parke, Widaman, and O'Neil (2001), who found a reciprocal relationship between peer acceptance and academic results in elementary school children in a three-year longitudinal study.

Lastly, Gifford-Smith and Brownell (2003) make an important point that contrasts with the trend in contemporary research to assess global, long-term phenomena; they by emphasize the utility of studying the issue of peer experiences by focusing on day-to-day dynamic changes in peer interactions. This could indeed lead to the discovery of micro-level mechanisms by which peers can influence school adjustment.

To conclude, studying the relationship between peer experiences in childhood and adolescence and high school graduation is fairly limited without transactional and well-controlled long-term longitudinal study designs spanning elementary and secondary school years until the end of adolescence or early adulthood.

Methodological Issues

The above-mentioned time-related issues involve particular technical difficulties. First, numerous and consistent assessments of peer experiences, academic functioning and potential confounders are required. Since research into peer acceptance using sociometric data necessitates group assessments, it is not always possible to collect follow-up data on students who have moved to another school. However, because sociometric data are based on peer reports, relevant information can be collected from peers even for participants who are not present on the day of assessment. Having such information on participants who are absent only on the day of assessment makes the problem of incomplete data less severe, as incomplete sociometric data is limited to participants who have completely quit the study (e.g., because they have gone to a different school). Measures of dyadic experiences, such as reciprocated friendship, however, are vulnerable to both types of attrition, as self-reports as well as peer reports are required to measure these variables.

Second, accounting for time-related issues may also involve some difficulties at the technical level. Even though simple statistical computations may sometimes be sufficient—such as calculating the proportion of years during which the participants were rejected to measure the chronicity of peer rejection (Laird, Jordan, Dodge, Pettit, & Bates, 2001)—more complex statistical analyses are often required. Consequently, the advancement of analytical strategies and of statistical software is likely to have a major impact on the development of theoretical models in the years to come.

One instance of this is the possibility of measuring the direction of change in peer experiences (increases, decreases, or non-linear changes) more easily than before by conducting multi-level analyses (Singer & Willett, 2003) or semiparametric group-based (mixture) models (Nagin, 1999). For example, Brendgen and her colleagues (Brendgen, Vitaro, Bukowski, Doyle, & Markiewicz, 2001) used Nagin's semiparametric procedure to establish social acceptance trajectories throughout the elementary school years. These

authors found three trajectory groups (stable popular, stable average, and unpopular with declining social preference scores) with distinct patterns of internalized and externalized problems. Similar procedures could be used in future research to verify whether distinct patterns of school adjustment are associated with the different trajectory groups.

In addition to assessing the direction of change, multi-level analyses may also be required to disentangle the contribution of different sets of variables that are nested into one another. Studies conducted in school environments may benefit from this type of analysis when the effect of classroom variables (e.g., teacher's behaviors) or of school variables (e.g., school climate) need to be distinguished from the contribution of individual variables (e.g. sociometric status) (Boyle & Willms, 2001).

Lastly, structural equation modeling (SEM) is particularly well-suited for testing mediator models, notably by reducing measurement error through the use of latent scores. There are a few examples of the use of SEM in short-term longitudinal studies testing theories about the role of peers in academic achievement in childhood (e.g., Ladd & Troop-Gordon, 2003) or in adolescence (e.g., Ary, Duncan, Duncan, & Hops, 1999). However, to our knowledge, no study using SEM to validate a transactional developmental model starting in childhood and leading to school graduation has been conducted as of yet, probably because gathering complete developmental data from early childhood to early adulthood for a sufficient number of participants is a long, difficult, and expensive process.

Overcoming methodological issues through well-advised analytic strategies and carefully designed longitudinal studies involving data collection over several time points at different developmental periods will make it possible to test whether the effects of peer experiences on high school graduation differ according to these experiences' developmental timing and duration, with minimal risks of spurious effects. In addition, it will allow for a test of bidirectional models with reciprocal effects between different types of peer experience and other variables that are likely to influence students' academic pathway towards school gradation. Ultimately, one should keep in mind that the only way

to provide support for causal theoretical models is to use experimental designs, perhaps implemented through intervention programs, aimed at increasing rates of high school graduation (e.g., August, Hektner, Egan, Realmuto, & Bloomquist, 2002). Twin and adoption studies could also contribute to the identification of gene-environment correlations and interactions that might increase the risks of not graduating from high school (Moffitt, Avshalom, & Rutter, 2005).

Conclusion

This review has shown that the impact of peer experiences in childhood and adolescence on high school graduation is a topic that has generated a great deal of interest among researchers. Studies conducted over the last few decades have served to refine theoretical models and empirically-based knowledge. They have shown that peer acceptance is a correlate of high school graduation. Nevertheless, more research is needed in order to uncover the long-term outcomes of early versus late and of chronic versus acute episodes of rejection, and to discover whether controversial and neglected students should be considered as at-risk groups as well. In addition, the impacts of being a bully and of crowd identification have been notably neglected in research into high school completion.

Extant research has revealed that having numerous friends is not, in itself, a very efficient predictor of high school graduation, because friends may have a positive or a negative influence on school achievement, depending on their own characteristics. Moreover, friendship quality may moderate both the positive and the negative effects of friendship on academic adjustment. Further research would benefit from the adoption of a set of objective criteria defining the concept of friendship, as it is hard to integrate the results of different studies that do not define this concept in the same way. As an extension of dyadic experiences, the influence of the clique also depends on the characteristics of clique members. Deviant clique affiliation is of particular interest, especially during

preadolescence or early adolescence, given the likelihood that such affiliation acts as a mediator of the effect of peer rejection on graduation status.

Further research into the influence of peer experiences on high school graduation should strive to address more global issues. First, all relevant variables (not only peer experiences) should be systematically included in empirical studies in order to control for confounding variables. Second, the impact of the interplay between different peer experiences on high school completion should be investigated. Studies examining several types of peer experience as predictors of academic adjustment in elementary school can be used as models for future work in this direction (e.g., Ladd et al., 1997). Third, long-term longitudinal studies spanning many years and taking into account such time-related variables as age, chronicity of peer experiences, and reciprocal effects between "independent" and "dependent" variables are also necessary to maximize the validity of empirical research. Finally, nesting an experimental design within a longitudinal study offers the ultimate test of a developmental model, as it is the only way to test for the hypothesized causal relations among variables.

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Preparation of this manuscript was made possible by two fellowships awarded to Marie-Hélène Véronneau, one by the Fonds Québécois de Recherche sur la Société et la Culture, and another by the Social Sciences and Humanities Research Council of Canada. We would like to thank Michel Claes, Michel Janosz and Sara Pedersen for their useful comments on previous versions of this manuscript.

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Footnote

[1] See Figure 1 for a simplified form of these two models, especially panel C for the incidental model and panel D for the mediator model. In both panels, "Peer Experiences" represents the friends' characteristics. To illustrate the process of selection, "Factor X" in panel C should be replaced by "student's personal characteristics", which predict the association with friends who share these characteristics. To illustrate the process of socialization, "Factor Y" in panel D should be replaced by "student's personal characteristics", which are influenced by friends' characteristics.

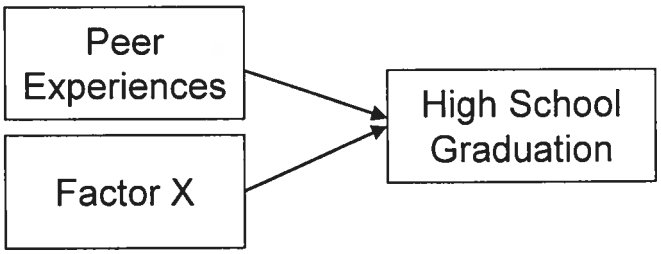
Figure Caption

Figure 1. Schematic representation of the four types of developmental model

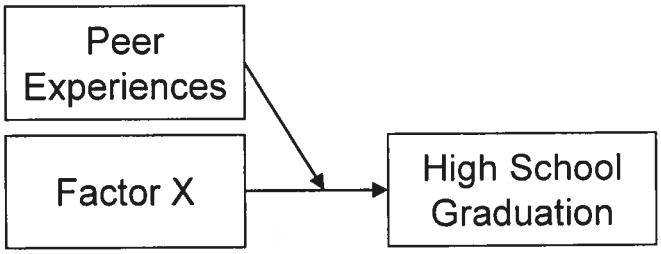
Figure 2. Schematic representation of the three subtypes of mediator model

Figure 1

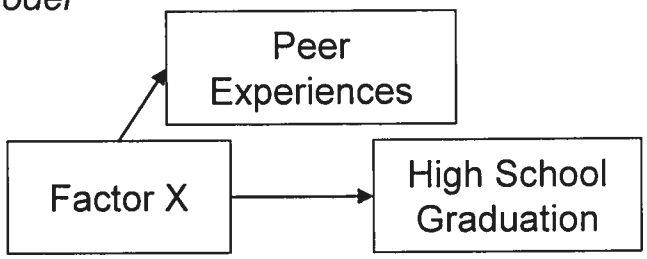
A) Additive model



B) Interactive model



C) Incidental model



D) Mediator model

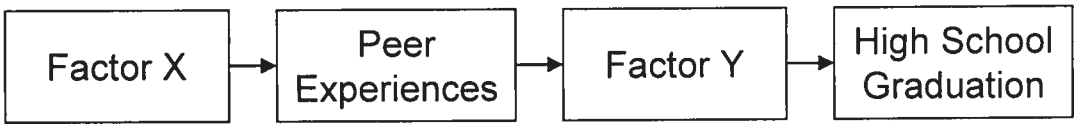
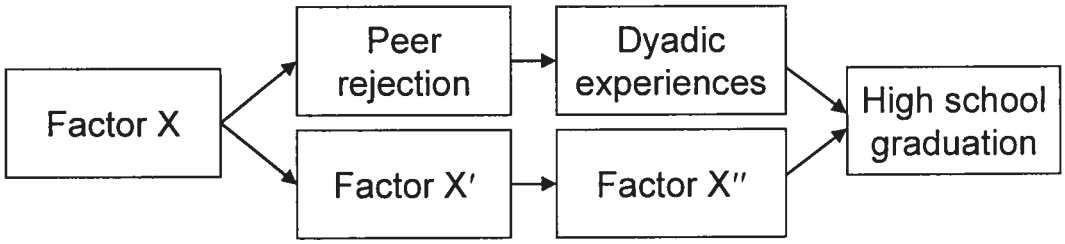
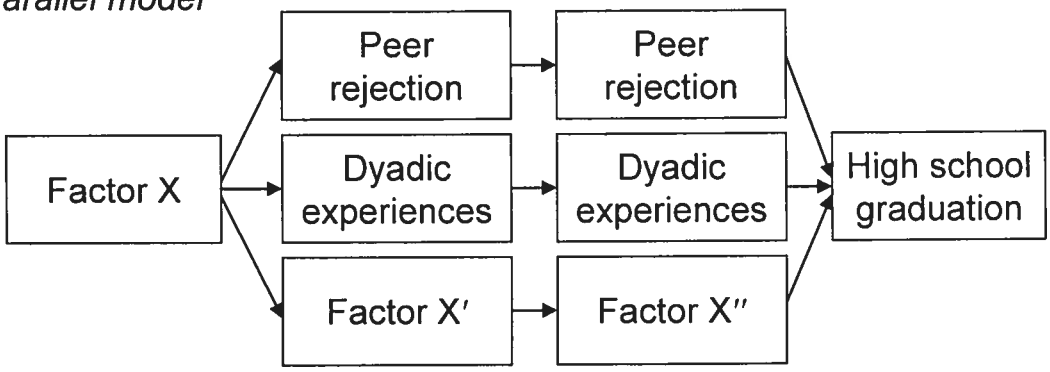


Figure 2

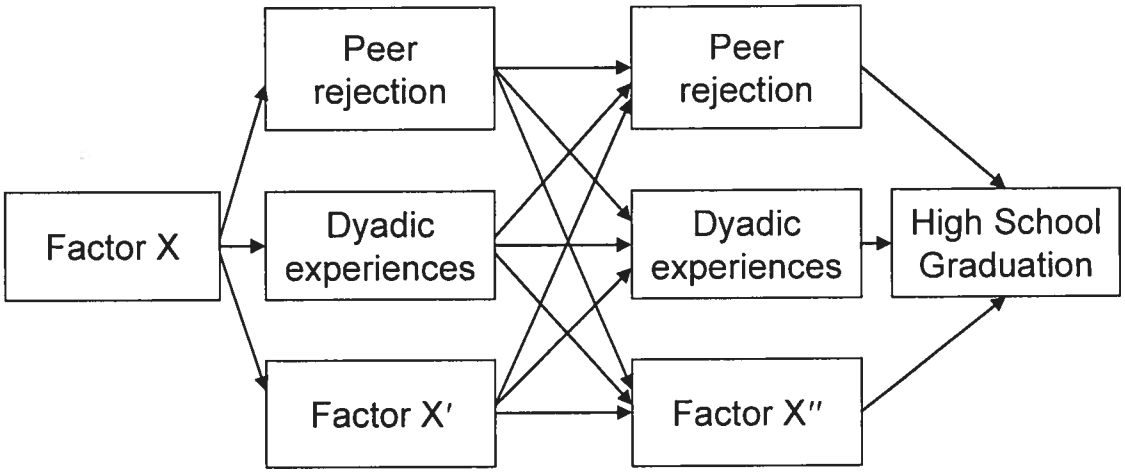
A) Sequential model



B) Parallel model



C) Bidirectional model



Article 2—Do Peers Contribute to the Likelihood of Secondary School Graduation Among Disadvantaged Boys?

Par Marie-Hélène Véronneau, Frank Vitaro, Sara Pedersen et Richard E. Tremblay

Abstract

This 17-year longitudinal study tested whether low peer-perceived acceptance and association with aggressive-disruptive friends during preadolescence predicted secondary school nongraduation. Participants were 997 Caucasian, French-speaking boys from low SES urban neighborhoods. The boys were recruited in kindergarten (age 6) and followed through early adulthood (age 23). Low prosocial behaviors and high aggressive-disruptive behaviors in childhood were expected to predict negative preadolescent peer experiences. Adolescent academic achievement and school commitment were expected to mediate the link between preadolescent peer experiences and early adulthood graduation status. Results of structural equation modeling analyses tended to support these hypotheses. Greater childhood aggression-disruptiveness positively predicted friends' preadolescent aggression-disruptiveness. Having aggressive-disruptive friends, in turn, was related to a lower likelihood of graduation. Lower academic achievement and school commitment partially mediated the association between friend characteristics and graduation. Peer acceptance did not contribute to graduation.

Keywords: Friendship, peer acceptance, academic adjustment, school graduation, longitudinal studies.

Do peers contribute to the likelihood of secondary school graduation among disadvantaged boys?

Failure to graduate from secondary school has been related to problems both at the individual and societal levels. At the individual level, such psychosocial problems as difficulties finding and maintaining employment, loss of wages, psychological maladjustment, and lower rates of community involvement have been associated with low educational attainment (Kaplan et al., 1994; Kerckhoff & Bell, 1998; McCaul et al., 1992). At the societal level, major social and economic changes, such as the aging workforce, technological innovations, and market globalization (Organisation for Economic Co-operation and Development, 2005), put increased pressure on industrialized countries to maintain a well-trained workforce. A high rate of secondary school graduation is one important goal societies must achieve in order to meet this global educational challenge.

Research that enhances our understanding of the experiences that might influence students' abilities to achieve a secondary school diploma is an essential first step toward increasing the secondary school graduation rate. The role of familial and individual factors in the process leading to secondary school graduation was extensively investigated during the second half of the twentieth century (see reviews by Ekstrom et al., 1986; and Rumberger, 1987). In contrast, studies assessing the contribution of peers to secondary school graduation are still scarce, despite the important role that peers play in adolescents' lives (Hymel et al., 1996; Vitaro et al., 2001). The current study focuses on peer-related variables as potentially important contributors to individual graduation outcomes in boys. Boys graduate from secondary school at much lower rates than girls and, thus, are of particular concern (Bowlby & McMullen, 2005a).

Preliminary conceptual clarifications

As put forward by Christenson, Sinclair, Lehr, and Godber (2001), school graduation (or nongraduation) should be distinguished from school persistence and its opposite, school interruption (i.e., school dropout). Graduation refers to the completion of the school program as attested by a diploma, whereas school dropout refers to an interruption of school attendance, which may be definitive (i.e., permanent dropout) or followed by a return to school (i.e., temporary dropout). Christenson and her colleagues found this distinction useful for designing interventions aimed at enhancing students' academic attainment; we suggest that this distinction is also crucial in the context of nonexperimental, descriptive research. In fact, Entwisle, Alexander, and Olson (2004) found that temporary dropouts who eventually graduate usually become well-adjusted adults, whereas permanent dropouts (i.e., nongraduates) often suffer psychosocial problems. In other words, it is not the interruption of school attendance *per se*, but rather the failure to complete the full academic program that most likely affects adjustment.

Nevertheless, because few studies use graduation as an outcome, it is useful to rely on dropout research to help identify relevant risk factors for nongraduation. In a review of the dropout literature, Rumberger (1987) makes a distinction between structural risk factors for dropout (e.g., socioeconomic status [SES] and gender) and "manipulable" variables that are likely to explain the process of school disengagement (e.g., students' behaviors or some aspects of the social milieu). While acknowledging the predictive value of the structural risk factors, he suggests that future research focus on "manipulable" variables because these can be targeted by interventions aimed at increasing graduation rates. This is why we focus on potentially "manipulable" social processes involving peers.

An integrative theoretical model of secondary school graduation

The current research was guided by an integrative model of secondary school graduation. This global model includes different types of predictors and processes that have been proposed by two complementary theoretical perspectives, namely the social interactional perspective and the participation-identification perspective of school withdrawal.

Socio-familial, behavioral, and peer-related antecedents of nongraduation: Contributions of the social interactional perspective. The social interactional perspective was introduced by Patterson and his colleagues to study the pathways towards antisocial behavior, a broad concept that includes school dropout as well as many other socially deviant behaviors (Patterson et al., 1989; Patterson et al., 1998; Patterson et al., 1992). From this perspective, nongraduation is the end result of a developmental pathway that starts at home, where young boys develop a coercive behavior pattern. Such behavior then leads to rejection by normative in-school peers and to the affiliation with deviant peers who reinforce problem behaviors and attitudes that are incompatible with academic success.

More precisely, according to this view, the family context in the preschool years—especially inefficient, harsh, and inconsistent parenting practices—often paves the way for antisocial behavior. Consistent with Rumberger's (1987) review of risk factors for school dropout, children born to families of lower SES are particularly likely to be raised in a risky family climate. The high stress levels experienced by parents living in precarious financial conditions in combination with their typically lower educational attainment may heighten the likelihood that they will use coercive and inconsistent parenting practices. In addition, low-SES parents are less likely to adopt the beliefs and behaviors that contribute positively to their children's academic success (Davis-Kean, 2005).

When a child raised in a risky family context enters school, the coercive pattern of behavior he or she has developed in response to the family environment may interfere with adaptation to the new milieu, because such behaviors are in contradiction to the prevailing social norms for effective interpersonal interactions outside of the family environment. Among other aspects of the child's psychosocial adjustment, experiences with peers may be severely affected by this lack of social skills. In the context of the social interactional perspective, two types of peer experiences have been examined, often separately.

First, peer acceptance or rejection by the peer group is thought to be crucial to children's psychosocial development. In Sullivan's interpersonal theory (1953), peers act as socializing agents, rewarding acceptable behaviors in other children through positive interactions. These positive interactions lead to the successful fulfillment of the child's need for group belongingness. Conversely, peers discourage unacceptable conduct by avoiding interactions with—or rejecting—children who display aggressive, disruptive, or coercive behaviors. Empirically, several studies have established that children displaying high levels of aggressive behavior and low levels of prosocial behavior are at greater risk of being rejected by their peers (Coie, Dodge, & Kupersmidt, 1990; Ladd & Troop-Gordon, 2003; Taylor, 1989; Vitaro et al., 1992; Wentzel, 2003). In turn, low levels of prosocial behaviors, high levels of aggressive behavior, and peer rejection are related to a heightened risk of school dropout (Ollendick et al., 1992; Vitaro, Brendgen, Larose, & Tremblay, 2005).

In addition to peer rejection, friends' deviancy also represents a fundamental aspect of the peer experience that is related to school dropout in boys (Vitaro et al., 2001). According to the social interactional perspective, forming friendships with deviant peers is an important step in the pathway towards antisocial behavior and, in the context of the current study, towards the failure to graduate from secondary school. Patterson et al. (1992) theorized that youngsters who are rejected by the peer group affiliate with other aggressive, rejected children in order to fulfill their socio-affective needs, and empirical

studies have supported this idea (Brendgen, Vitaro, & Bukowski, 1998; Dishion et al., 1991; Laird et al., 2001; Vitaro, Pedersen, & Brendgen, 2007). However, friendships among aggressive and rejected students are usually short-lived and low in quality (Bagwell & Coie, 2004; Dishion et al., 1995; Parker & Asher, 1993b). As a result, these unsatisfying friendships may have a negative rather than a positive impact on psychosocial and academic outcomes in children and adolescents (Burk & Laursen, 2005; Ladd et al., 1996; Lansford, Criss, Pettit, Dodge, & Bates, 2003).

This may be especially true if friends of future school dropouts have similarly negative school-related experiences, including academic failure and rejection by peers and school staff, as well as feelings of alienation from school (Ekstrom et al., 1986). Through the process of peer socialization (Kandel, 1978), deviant friends may reinforce or model attitudes and behaviors that are incompatible with school success (Dishion, McCord, & Poulin, 1999). There is preliminary support for the hypothesis that students who associate with friends who reject school are more likely to disengage from school (Battin-Pearson et al., 2000; Pittman, 1991). Such disengagement can lead to truancy and school dropout.

The main strength of the social interactional perspective is its explicit acknowledgement that several types of risk factors work together from the earliest years of life to deter some individuals from following adaptive psychosocial and educational trajectories, such as those leading toward secondary school graduation. This theory, however, was developed to explain boys' antisocial behavior in general, not the failure to graduate from secondary school in particular. As a result, it is not clear whether the peer processes described earlier (i.e., peer acceptance at the group level and friends' characteristics at the dyadic level) play an active (i.e., mediating) role in the process leading disruptive and socially unskilled boys to encounter school problems and, ultimately, to fail to obtain a secondary school diploma. In addition, the individual psychological processes that might explain or mediate the hypothesized role of peer experiences with regard to school withdrawal are not clearly defined. The participation-

identification perspective described by Finn (1989) specifies which psychological processes may be involved and thus complements the social interactional perspective in explaining how negative peer experiences may contribute specifically to nongraduation from secondary school.

Psychological and motivational antecedents of nongraduation: Contributions of the participation-identification perspective. Finn (1989) suggested that students undergo a cycle of academic participation and identification with school during their school years. For most students, active participation in school activities leads to positive academic outcomes (e.g., high academic achievement), which in turn reinforce psychological and emotional identification with school. School identification—described as a feeling of belongingness to the school milieu and as the internalization of the school's goals and values—is thought to be essential to academic perseverance and secondary school graduation.

However, for some students, the participation-identification cycle is disrupted, thereby affecting both academic performance and commitment to schooling. These students may fail to internalize the school's goals and values, increasing the odds of premature school withdrawal and nongraduation. Negative peer relationships are a potential disruptor of this cycle. For example, ostracism by the peer group may generate aversion for classmates and school in general (see review by Hymel et al., 1996). Having friends with deviant attitudes and behaviors may also influence boys to behave in deviant ways (Dishion et al., 1995), so that school disengagement might be contagious within deviant peer groups.

The impact of peer experiences on secondary school graduation

By combining the variables that were identified as crucial elements in the pathway leading to nongraduation from secondary school according to either the social interactional or the participation-identification perspectives, we have developed the comprehensive

model presented in Figure 1. As suggested by these theoretical perspectives, peer experiences are depicted as central elements in the developmental pathway leading to school disengagement and, ultimately, to nongraduation. Still, much empirical research remains to be done in order to confirm the validity of this model.

One important issue that needs to be addressed is the distinct contribution of different aspects of the peer experience (Furman & Robbins, 1985; Hartup, 1996; Sullivan, 1953). Gifford-Smith and Brownell (2003) suggested that most studies of peer relations examine a single aspect of this experience (e.g., either peer acceptance or friends' characteristics). However, the only way to uncover the unique effects of different types of peer experiences is to incorporate all of these variables within the same study.

Another issue that deserves special attention has been raised by several authors (e.g., Finn, 1989; Hymel et al., 1996; Rumberger, 1987), who contend that even though the correlation between early peer difficulties and school dropout is well-established, very little is known about the psychological processes behind this relation. In fact, longitudinal studies often focus on observable (social, behavioral, and academic) variables rather than on the psychological process of disengagement.

In order to address these issues, the current study assessed two distinct types of peer experiences that are likely to contribute to secondary school graduation in boys. These include peer acceptance and friends' aggressive behaviors. We also took into account the role of school commitment and academic achievement as "psychological consequences" of negative peer experiences and, consequently, as proximal precursors of nongraduation that could mediate the effects of negative peer experiences (see Figure 1). Other established precursors of graduation were also taken into account as control variables (i.e., SES and early academic achievement).

Current study

The longitudinal data used to test the proposed developmental model was collected over several periods of development, including childhood (period 1), preadolescence (period 2), adolescence (period 3), and early adulthood (period 4).[1]

In period 1, children's behaviors serve as antecedents of the peer experiences. Specifically, high levels of aggressive-disruptive behaviors as well as low levels of prosocial behaviors are the hypothesized antecedents of low peer acceptance and association with aggressive-disruptive friends in preadolescence (period 2).

Next, negative preadolescent peer experiences are hypothesized to predict nongraduation because they interfere with normal learning activities and contribute to psychological disengagement from school. In other words, peer experiences in preadolescence (period 2) should predict students' academic achievement and commitment to educational goals and values during adolescence (period 3). Finally, lower academic achievement and school commitment during adolescence (period 3) are hypothesized to predict nongraduation by early adulthood (period 4) directly (and act as mediators of the association between negative peer experiences and nongraduation).

Lower family SES and academic achievement in childhood are early risk factors for deviant school pathways and, as such, they are used as control variables. In order to perform a more stringent test of mediation, control variables were assumed to be related not only to the dependent variable, but also to all other variables in the model.

This study was performed with a community-based sample. However, participants had a relatively high risk of not graduating from secondary school, since they were boys recruited from public schools located in low-SES urban neighborhoods. Indeed, while the overall provincial graduation rate for male and female students aged 20 years or less was 71.7% (Education Department, 2001), the rate of graduation among our participants by age

23 was only 53.3%. More precisely, 49.7% of participants graduated without interrupting their schooling, and 3.6% graduated in spite of having temporarily dropped out of school.

Method

Participants

Participants were recruited when they were six years old at the end of the 1983-1984 school year, in the context of the Montreal Longitudinal Experimental Study, a larger project aimed at studying the psychosocial development of low-SES, urban boys. This community-based sample initially targeted all boys attending kindergarten in the 53 public schools located in low-SES neighborhoods that were part of the Montreal French school board (Quebec, Canada). From the 1161 boys recruited (85.0% of the targeted sample), only the 1037 boys whose parents were born in Canada and spoke French as a first language were retained in the study. Data on the dependent variable, secondary school graduation by 23 years old (2001), was available for 98.2% of this sample (1018 participants). Sixteen participants had died by that time and 3 had moved out of the country. Because of incomplete data, the final sample used for the main analysis was composed of 997 participants. (Details on attrition are provided in the results section.)

Measures

All measures were administered in French. Instruments that were only available in English were translated into French and back-translated into English. The back-translations were compared to the original version of the questionnaires by English-speaking judges who verified that the original meaning was preserved. The timing of assessments and descriptive statistics for all instruments are presented in Table 1. Since the skewness statistic for all variables ranged from -.33 to .92, and kurtosis ranged from -1.98 to .21, normality of the data was deemed satisfactory for further analyses.

SES. Parents' occupational prestige was computed from their earning and educational levels (Blishen, Carroll, & Moore, 1987). The measure was taken when participants were 6 years old (first year of the study) or at a subsequent year if earning and educational data were not available at the first wave of data collection (see the attrition subsection under the results section for more details on this imputation procedure). For most participants, a score was available for both parents, so an average score was used.

Blishen et al. do not mention a specific range of scores for low-SES occupations, but they report a mean score (42.74) and the standard deviation (13.28) for their instrument. The minimum score on this scale is 17.81, which corresponds to the occupations of newspaper carrier and vendor. The average score for this sample (38.45, SD = 10.70) is about one-third of a standard deviation below the mean proposed by Blishen et al. It is lower than the mean obtained by a representative sample of boys living in the province of Quebec over the same period (42.08, SD = 12.09). Examples of occupations that correspond to the average SES score for the current sample are: orderlies, mail and postal clerks, and machine tool operators.

Academic achievement in early elementary school years. Elementary school teachers reported on students' academic achievement in French (first language) and mathematics in 1985 and 1988 (ages 7 and 10), which correspond to grades 1 and 4 for students in age-appropriate classrooms. In order to increase the reliability of the scores obtained from this measure, an average score of academic achievement over the two years was computed to represent academic achievement in childhood. For the participants with incomplete data at one of these assessments (28.3% of the final sample), we used the value obtained at the other assessment, so they did not have to be excluded from the analyses due to incomplete data. Final scores ranged on a continuous scale from 0 (academic failure) to 4 (excellent academic performance). A correlation of $r = .53$ ($p < .001$) was found for academic achievement in grades 1 and 4, based on participants with complete data at both times of measurement (64.2% of total sample).

Participants' behavior in early elementary school years. Kindergarten and elementary school teachers reported on students' aggressive-disruptive behaviors and on their prosocial behaviors in 1984 and 1988 (ages 6 and 10), which correspond to kindergarten and grade 4 for students in age-appropriate classrooms, using the Social Behavior Questionnaire (SBQ: Tremblay, Desmarais-Gervais, Gagnon, & Charlebois, 1987; Tremblay, Vitaro, Gagnon, Piché, & Royer, 1992). Aggression-disruptiveness was assessed with items such as "This child bullies," "This child kicks, bites or hits," and "This child is restless and cannot stand still" while prosociality was assessed with items like "This child praises other students" and "This student helps clear up a mess," which were rated 0 (never), 1 (sometimes), or 2 (often). Scores on the 13-item aggression-disruptiveness scale ranged from 0 to 26, with higher scores representing frequent occurrences of aggressive-disruptive behaviors. Cronbach's alpha for this scale was .93 for the kindergarten assessment and .92 for the grade 4 assessment. Scores on the 10-item prosocial scale ranged from 0 to 20, with higher scores representing frequent occurrences of prosocial behaviors. Cronbach's alpha for this scale was .92 for the kindergarten assessment and .91 for the grade 4 assessment. A correlation of $r = .47$ ($p < .001$) and of $r = .23$ ($p < .001$) were found respectively for aggressive-disruptive and prosocial behaviors in kindergarten and grade 4, based on participants with complete data at both times of measurement (94.2% and 94.0% of total sample, respectively). In order to increase the reliability of the scores obtained from these measures, the average score over the two years was used for each scale. For participants with incomplete data at one of these assessments, we used the value obtained at the other assessment.

Peer experiences in late elementary school years. Measures of peer experiences were based on scores obtained in 1989 and 1990 (ages 11 and 12), which correspond to grades 5 and 6 for children in age-appropriate classrooms. Again, these measures were averaged over the two years.

For peer experiences at the group level, a measure of peer-perceived acceptance in the peer group was used. Scores on two items, namely "Those who are liked by everyone" and "Those who have very few friends," were combined to create this variable. These items were part of the Pupil Evaluation Inventory (PEI: Pekarik, Prinz, Liebert, Weintraub, & Neale, 1976) that was administered to all children in the classrooms attended by the participants. For each item, students could nominate up to four classmates. The total number of nominations received by each participant on every item was standardized within their classroom. A correlation of $r = .65$ ($p < .001$) was found for peer acceptance in grades 5 and 6, based on participants with complete data at both times of measurement (74.9% of total sample).

For measures of dyadic peer experiences, participants' friends were identified using reciprocated nominations on the item "Those who are your best friends" from the PEI questionnaire. Then, friends' scores on the 20-item aggression-disruptiveness scale of the PEI (including items like "Those who start a fight over nothing" and "Those who disturb other students who are trying to work") were used to assess their level of aggressive-disruptive behaviors. Cronbach's alpha for this scale was .97 for the grade 5 assessment and .96 for the grade 6 assessment. For participants with more than one reciprocated friend, an average score for all friends was computed. The 303 participants (30.4%) who had no reciprocated friends at both assessments did not have to be excluded altogether from the main analyses as the full information maximum likelihood method was used to manage incomplete data. More information on this procedure will be provided in the attrition subsection, under the results section. A correlation of $r = .22$ ($p < .001$) was found for reciprocated friends' scores of aggression-disruptiveness in grades 5 and 6, based on participants with complete data on their reciprocated friends' characteristics at both times of measurement (38.4% of total sample).

Academic achievement and school commitment during secondary school. Teachers reported on students' academic achievement in French (first language) and mathematics

from 1992 through 1995 (ages 14 through 17), which correspond to grades 8 through 11 for students in age-appropriate classrooms.[2] An average score of academic achievement in French and mathematics across the four years was computed so as to represent academic achievement during adolescence. Final scores ranged on a continuous scale from 0 (academic failure) to 4 (excellent academic performance). Correlations between scores of academic achievement for all pairs of assessments over this four-year period ranged from r = .29 to r = .58 ($p < .001$). The proportion of participants with complete data on each pair of assessments ranged from 60.3% through 76.9% of the total sample.

School commitment was measured through self-reports with a seven-item scale including such statements as "How much does having good grades matters to you?" and "How long do you intend to stay in school?" Once again, an average score, based on all available data gathered from 1992 through 1995 (ages 14 through 17) was used. Each item was rated on a scale ranging from 1 to 4 (total scores ranging from 7 to 28), with higher scores reflecting higher school commitment. Cronbach's alpha for this scale ranged from .67 to .71, depending on the year of assessment. Correlations between scores of school commitment for all pairs of assessments over this four-year period ranged from r = .47 to r = .69 ($p < .001$). The proportion of participants with complete data on each pair of years ranged from 63.6% through 77.4% of the total sample.

Graduation from secondary school. Data on graduation status by early adulthood (age 23, December 2001) was available from the Education department's official records. Although the normal age of graduation in the province of Quebec is 17 years old, temporary dropout and grade retention delayed the time of graduation for several students. In the current sample, only 32.2% of the participants were placed in regular, age-appropriate classrooms by the time they reached their final year of secondary schooling, and 11.2% of the participants were one year behind. The remaining 56.6% of the participants were two or more years behind grade level, had been placed in special classrooms for students with learning or behavioral difficulties, or had dropped out of

secondary school. Still, by 23 years of age, 26.3% of this final group had graduated (89.9% of students who were no more than one year behind had graduated by age 23). According to Bowlby and McMullen (2005a), the probability of completing secondary schooling has dramatically decreased by 20 to 24 years old. Age 23 is thus an appropriate time for measuring graduation status, as this status is likely to be definitive for most participants.

Procedure

Participants were recruited around the end of their kindergarten year (spring 1984). With the collaboration of 53 public schools located in low-SES areas of Montreal and its immediate surroundings, questionnaires were sent to the parents of all boys attending kindergarten at those schools. A consent form explaining the study was sent in the same package and had to be signed and returned by mail along with the questionnaire. This procedure was repeated every year, and parents were informed that their son would fill out questionnaires at school when that was the case. For each participant, one teacher filled out a questionnaire assessing the student's behavior and academic achievement at every year.

Results

Structural equation modeling (SEM) was used to assess the fit of the model presented in Figure 1. Attrition, intraclass correlations (to assess between-school effects), and bivariate correlations among the main measures are presented first.

Preliminary analyses

Attrition. The use of SEM allowed for the inclusion of all participants having complete data on exogenous variables even if they had incomplete data on other variables. In the current model, SES was the only exogenous variable. It was therefore important to minimize the number of participants with incomplete data on this particular variable. Data on SES at the first wave of data collection (1984) was available for 973 participants, but

given that the correlation between SES in 1984 and the same variable measured in subsequent years was high (ranging from $r = .62$ to $r = .67$), available data from the nearest following year (1988, 1989 or 1990) was used for participants with incomplete values in 1984. Using this strategy, only 40 participants were lost due to incomplete data. Thus, 997 participants out of the 1037 initially recruited could be included in the primary analysis using SEM, preserving 96.1% of the initial sample.

Excluded participants had significantly lower academic achievement in elementary school, t (967) = -3.93, $p < .001$, lower levels of prosocial behaviors, t (1035) = -2.82, $p < .01$, lower school commitment in secondary school, t (901) = -2.09, $p < .05$, and lower academic achievement in secondary school, t (896) = -3.19, $p < .01$, than participants who were included in the primary analysis. A chi-square test also revealed that excluded participants tended to be less likely to graduate from secondary school, although this difference was only marginally significant, χ^2 (1, N = 1018) = 3.67, $p = .06$. However, no significant differences emerged on their levels of aggressive-disruptive behaviors in childhood, their friends' levels of aggressive-disruptive behaviors, and their levels of peer acceptance.

Incomplete data on endogenous variables was handled using the full information maximum likelihood method. Therefore, the covariance matrix was constructed from all available information for each participant. Complete data on each relevant pair of variables ranged from 67.8% through 100.0% of the final sample (N = 997), with an average of 86.5%.

Intraclass correlations. Since participants were recruited from different schools, intraclass correlations were computed in order to verify whether some of the variance in the main variables of the model (i.e., participants' behaviors in childhood, peer experiences in preadolescence, academic achievement and school commitment in adolescence, and nongraduation) could be attributed to a higher-order "school effect". These analyses revealed that a significant proportion of variance in these variables was attributable to

school. Effect sizes were small to moderate (Hox, 2002), ranging from 4% (for aggressive-disruptive behaviors in childhood) to 11% (for nongraduation). Although the hierarchical structure of the data may suggest that a multilevel analytic framework is desirable, the distribution of the participants into 197 different institutions after the transition to secondary school entails some restrictions with regard to the application of a multilevel analytical procedure. In fact, the small number of participants per school—50% of the schools included only one participant, and only 25% of schools included five or more participants—made implementing a multilevel framework inadvisable (Newsom & Nishishiba, 2002).

Bivariate correlations. Correlations, which are presented in Table 2, were all in the expected direction. First, SES was positively related to academic achievement, prosocial behavior, peer acceptance, and school commitment, but negatively related to participants' aggressive-disruptive behaviors and nongraduation. However, SES was unrelated to friends' level of aggressive-disruptive behaviors.

Still in line with the hypotheses, academic results in childhood were negatively correlated with concurrent aggressive-disruptive behaviors, but positively associated with prosocial behaviors. In addition, boys with higher levels of academic achievement in childhood tended to associate with less aggressive-disruptive friends in preadolescence. They also tended to have higher levels of peer acceptance in preadolescence, higher levels of school commitment and academic achievement during adolescence, and lower risks of nongraduation.

Aggressive-disruptive behavior in childhood was negatively correlated with prosocial behaviors. Boys who were more aggressive-disruptive in childhood tended to associate with aggressive-disruptive friends and have low levels of peer acceptance in preadolescence. Early aggression-disruptiveness was also related to low levels of adolescent school commitment and academic achievement and to nongraduation from secondary school. Prosocial boys tended to experience greater peer acceptance and have

friends with lower levels of aggressive-disruptive behaviors in preadolescence. Prosociality was also related to higher levels of school commitment and academic achievement during adolescence as well as a lower risk of nongraduation.

No correlation emerged between peer acceptance and the concurrent level of friends' aggressive-disruptive behaviors. Still, having more aggressive-disruptive friends in preadolescence predicted lower levels of adolescent school commitment and academic achievement as well as a greater risk of nongraduation. In contrast, greater peer acceptance in preadolescence predicted greater adolescent school commitment and academic achievement as well as a lower risk of nongraduation.

Finally, greater school commitment was positively related to academic achievement in adolescence. Both commitment and academic achievement were inversely related to nongraduation.

Model testing

All analyses were conducted with M*plus* 3.01 (Muthén & Muthén, 2004) using weighted least squares estimation. We first examined the fit of a baseline model in which all variables were completely unrelated. The fit of this model was very poor, χ^2 (20) = 1050.45, $p < .001$. (In SEM analyses, a good model fit usually yields a nonsignificant chi-square statistic). We then tested our hypothesized model in order to assess any improvements in fit.

The hypothesized model (M_1)—a saturated model—was tested first. Some of the hypothesized paths were not significant and were therefore removed in order to build a more parsimonious model. The final model, M_2, is illustrated in Figure 2, with standardized coefficients for all significant paths. Arrows in bold indicate significant indirect pathways. Fit indices suggest that this model fits the data very well, χ^2 (10) = 8.57, $p = .57$, CFI = 1.00, TLI = 1.00 (CFI and TLI values above .95 are indicative of a good fit).

The non-significant chi-square value of the final model (M_2) suggests that the original, saturated model (M_1) does not fit the data significantly better than the more parsimonious model (M_2).

Direct paths. In line with the hypotheses, most of the direct paths included in the initial model were statistically significant.

First, SES was a significant predictor of childhood academic achievement. In line with our hypotheses, higher SES predicted lower levels of childhood aggressive-disruptive behavior, higher preadolescent peer acceptance, and higher adolescent academic achievement and school commitment. Higher SES was associated with lower odds of not graduating.

Higher levels of the other control variable, childhood academic performance, predicted lower levels of aggressive-disruptive behavior and higher prosociality in childhood. It also predicted higher preadolescent peer acceptance, and higher adolescent academic achievement and school commitment. Finally, it was negatively associated with nongraduation.

Childhood aggression-disruptiveness was negatively associated with concurrent levels of prosociality. It was positively associated with friends' preadolescent aggression-disruptiveness and negatively associated with preadolescent peer acceptance. Higher levels of childhood aggression-disruptiveness were associated with lower adolescent academic achievement and school commitment, and it was a significant predictor of nongraduation. In contrast, childhood prosociality predicted higher preadolescent peer acceptance and adolescent school commitment.

As revealed by the preliminary bivariate analyses, preadolescent peer acceptance and friends' aggression-disruptiveness were not significantly intercorrelated. Friends' preadolescent aggression-disruptiveness predicted lower levels of adolescent academic achievement and school commitment. However, in contrast to the bivariate analyses,

preadolescent peer acceptance was not related to the hypothesized adolescent mediators (i.e., school commitment and academic achievement).

Finally, both adolescent mediators, school commitment and academic achievement, were significantly and positively intercorrelated. They were associated with lower odds of nongraduation.

Indirect paths. The principal objective of this study was to determine whether peer experiences played an active (i.e., mediating) role in the pathways leading to nongraduation from secondary school. We tested a number of indirect paths in which peer experiences were hypothesized (a) to relate to nongraduation via school-related variables in adolescence and (b) to mediate the association between childhood behaviors and the adolescent precursors of nongraduation.

Eight indirect paths were modeled in order to reflect all possible indirect pathways from childhood aggressive-disruptive and prosocial behaviors to nongraduation from secondary school in adulthood via friends' aggressive-disruptive behaviors and peer acceptance in preadolescence and subsequent adolescent school commitment and academic achievement. In addition, we tested four indirect paths from childhood aggressive-disruptive and prosocial behaviors to nongraduation that included school commitment and academic achievement as mediators, but excluded the peer experiences. This procedure was used to minimize the risk of overestimating the variance attributed to the indirect paths that included the peer experiences.

The final model revealed support for two of the eight possible indirect paths involving peer experiences. First, as illustrated in Figure 2 by the bold arrows, the path starting from participants' aggressive-disruptive behaviors and running through friends' aggressive-disruptive behaviors as well as school commitment was significant, although the standardized coefficient for this pathway was small (.01). The other significant indirect path started from participants' aggressive-disruptive behavior, which led to friends'

aggressive-disruptive behaviors, adolescent academic achievement, and, finally, nongraduation, (standardized path coefficient = .01). Peer acceptance was not a mediator in any pathway linking early behavior to nongraduation.

It is noteworthy that in addition to the role played by aggressive-disruptive behavior in childhood in the above-mentioned indirect pathways involving friends' aggressive-disruptive behavior, participants' aggression-disruptiveness was also related to nongraduation through other pathways. For example, childhood aggression-disruptiveness was directly related to adolescent school commitment which, in turn, predicted nongraduation, (standardized path coefficient = .03). Childhood aggression-disruptiveness was also related to adolescent academic achievement which, in turn, predicted nongraduation, (standardized path coefficient = .02).

One additional indirect path—from prosocial behavior in childhood to school commitment to nongraduation—explained a significant proportion of variance in this outcome (standardized path coefficient = -.03).

Discussion

The current study was meant to test a comprehensive model of nongraduation from secondary school in which two types of peer experiences—peer acceptance and friends' aggressive-disruptive behavior—were hypothesized (a) to be independent and significant predictors of nongraduation, and (b) to play a mediating role in the path from early behavior to nongraduation. Specifically, as suggested by the social interactional perspective, peer experiences were embedded into a chain of events occurring over several developmental periods and were hypothesized to be predicted by behavior patterns in childhood. Also, according to the participation-identification perspective, two proximal predictors of nongraduation were hypothesized to mediate the link between peer experiences during preadolescence and secondary school graduation, including school commitment and academic achievement during adolescence.

SES, early academic performance, and childhood behavior patterns. Although peer experiences were the central variables in our model, several of the links among variables that were included in the model for control purposes were significant and warrant attention. First, as expected, SES had a significant direct and negative relationship with nongraduation. As explained earlier, parents' behaviors and expectations, together with the lack of family resources, are potential mediators of this link. However, these variables were not included in the study, which might account for the residual link between SES and nongraduation.

Second, poor academic achievement in the early elementary school years was found to predict nongraduation over and above academic achievement in secondary school. Although proximal measures of a given variable (in this case, academic achievement in secondary school) are usually expected to be stronger predictors of the outcome, the current study shows that this is not always true. Our finding, however, makes sense from a developmental psychopathology perspective. Early schooling experiences initially direct students along an academic trajectory and may lead to a range of events that keep students on that particular path. In the current study, poor academic achievement during the first years of schooling was not only the strongest direct predictor of nongraduation but also contributed to other variables in the model (i.e., participants' aggressive-disruptive and prosocial behaviors in childhood, and academic achievement and commitment in secondary school). Early academic difficulties might be stronger predictors of nongraduation than later difficulties because they affect young children's school-related self-esteem and self-efficacy as well as their relationships with school staff. In contrast, academic difficulties that emerge in secondary school may simply precipitate school dropout in some students, without affecting students' deeper beliefs in their academic abilities or capacity to graduate if they ever wish to complete the secondary school program.

Third, a significant direct link was found between aggressive-disruptive behaviors in childhood and nongraduation by early adulthood. This link, which was also found in several empirical studies, cannot be entirely explained by ensuing peer difficulties. Other mediators should therefore be explored in future studies. For example, being more aggressive and disruptive than other students may be the first step in a developmental pathway towards nongraduation because such behaviors affect students' relationships with teachers. These students may not receive the same amount of help, support and encouragement in their schoolwork (Brendgen, Wanner, Vitaro, Bukowski, & Tremblay, 2007).

In contrast to participants' levels of aggression-disruptiveness, no residual link emerged between prosociality in childhood and nongraduation from secondary school. The contribution of low prosociality to nongraduation was therefore entirely mediated by school commitment in adolescence. This suggests that prosocial behaviors in school may be an early indicator of a student's stable tendency to conform to social norms and expectations. In addition, this finding could indicate that prosocial children are more likely to have positive experiences in school (e.g., being praised by the teacher) that help them identify with the institution.

The role of aggressive-disruptive friends. In partial support of our hypotheses, two of the indirect pathways involving the association with aggressive-disruptive friends during preadolescence were significant. Indeed, both pathways starting from aggression-disruptiveness in childhood and running through friends' aggressive-disruptive behavior during preadolescence were significant. The first pathway contributed to school graduation through the link between friends' behavior and school commitment, whereas the second pathway reached school graduation through the link between friends' behavior and academic achievement. These findings support the validity of our integrative theoretical model, in which variables from the participation-identification perspective (i.e., school

commitment and academic achievement) effectively complement the social interactional framework.

In contrast, the indirect pathways involving prosocial skills in childhood, peer experiences, and graduation status by early adulthood were nonsignificant. This is surprising, given that a lack of prosocial skills has been hypothesized to contribute to negative peer experiences to the same degree as aggressive-disruptive behaviors (Patterson et al., 1989). Still, we found an indirect pathway starting from low prosociality in childhood and predicting nongraduation through its link with low school commitment in adolescence. It seems possible that other types of peer-related problems that were not measured in the current study, such as friendlessness or an association with friends who are deviant but not aggressive-disruptive (e.g., friends who are truant or who cheat on exams, but who are not disruptive in the classroom and who do not get involved into fights), are involved in this indirect pathway.

In line with this suggestion, future studies should extend their measures of friends' characteristics so as to include not only negative, but also positive traits, as previous research has shown that friends can play a positive role in the context of students' school adjustment (Berndt et al., 1999; Berndt & Keefe, 1995; Chen, 2005; Mounts & Steinberg, 1995; Wentzel et al., 2004). For example, affiliating with friends who have developed positive attitudes towards school and authority figures, who intend to undertake post-secondary education, and who display good study habits, is likely to predict later secondary school completion. Affiliation with such friends could also protect vulnerable students against school disengagement and nongraduation.

The current study's results suggest that parents of preadolescent boys who are at risk for nongraduation can promote their sons' successful completion of the secondary school program by monitoring the boys' social activities during preadolescence. Although parents often allow their children to spend more time with their friends in unsupervised settings as they grow older, mothers and fathers should at least get to know their children's

friends and encourage associations with those who do not display excessive levels of aggression and disruptiveness. This is especially important in the case of boys who have a personal history of aggressive-disruptive behavior or who displayed low levels of academic achievement in elementary school.

Furthermore, because many friendships arise in the school setting, teachers are in a very good position to identify potentially risky associations between aggressive-disruptive youngsters. Teachers should work together with parents to encourage at-risk students to become friends with well-adapted students who may not only be positive role models, but who can also actively discourage deviant behaviors and negative attitudes towards school. School administrators can contribute to this end by providing a variety of extracurricular activities through which at-risk students can meet and develop friendships with normative peers in adult-supervised settings.

The role of peer acceptance. In contrast to the positive results obtained for the other type of peer experience, the role of peer acceptance as a fundamental element in the developmental pathway leading to school graduation was not supported by the current study. Still, peer acceptance should not be dismissed as a potential contributor to school graduation.

First, the timing of measurement might explain the failure of peer acceptance to play a role in the pathway leading to school graduation. In fact, although peer acceptance should, according to some authors (Buhrmester & Furman, 1986), contribute to psychological adjustment even after childhood, others suggested that peer acceptance is most important during the first years of schooling. In contrast, dyadic peer experiences (such as the association with aggressive-disruptive friends) are most important in preadolescence or adolescence, according to this second group of authors (Patterson et al., 1992; Sullivan, 1953).

Second, as suggested by the social interactional perspective, early peer rejection may pave the way for later involvement with aggressive-disruptive friends. To test for this possibility, future studies of the developmental processes leading to secondary school graduation should adopt a strategy that would pit two models against one another. In one model, peer acceptance and association with aggressive-disruptive friends would act on future adjustment in a parallel manner. In the alternative sequential model, peer rejection would predict subsequent associations with deviant friends, which would in turn predict school adjustment problems in early adulthood. Comparing these two models would require the assessment of both types of peer experiences throughout childhood and adolescence. As we did not measure peer experiences before and after preadolescence, such a model could not be tested in the current study.

A third explanation for the non-significant results obtained with peer acceptance is that the operationalization of this variable might have failed to represent the construct it was meant to measure. In fact, in the theories proposed by Sullivan (1953) and by Patterson and his colleagues (1992), peer acceptance corresponds to being well-liked by one's peers. Students' positive feelings towards one another are best measured with a procedure of like-most and like-least peer nominations (e.g., Coie, Dodge, & Coppotelli, 1982; Newcomb & Bukowski, 1983). In the current study, however, peer acceptance was evaluated through peer nominations of students having many friends and of those having very few friends. According to Parkhurst and Hopmeyer's criteria (1998), this procedure may be closer to an assessment of "peer-perceived popularity," rather than "sociometric popularity." In other words, our measure probably reflected the extent to which classmates considered our participants as popular and high in social status, rather than their true feelings of liking towards our participants. Indeed, Parkhurst and Hopmeyer found that peer-perceived popularity is a correlate of social dominance, and although some students who get high ratings on this measure are perceived as kind and trustworthy by their peers, many others are perceived as aggressive and "stuck-up." Other researchers who measured peer-perceived popularity by asking participants to rate their classmates on a five-point

scale ranging from "not at all popular" to "very popular" found that increases in this variable over four academic semesters were related to decreases in academic achievement over the same period of time, but only in highly aggressive adolescents (Schwartz, Gorman, Nakamoto, & McKay, 2006). In contrast, Ollendick, Weist, Borden, and Greene (1992) reported that a rejected status, measured through sociometric nominations, was associated to a higher risk of dropping out of school by grade 9.

It is noteworthy that the significant results obtained with friends' aggressive-disruptive behaviors and the non-significant results obtained with peer acceptance may suggest the existence of a third variable effect—also known as a spurious or incidental effect (Ladd & Troop-Gordon, 2003; Woodward & Fergusson, 2000). In fact, one might put forward the hypothesis that any significant relationship between peer acceptance and later school adjustment found in previous studies was a mere reflection of the true relationships existing between two correlates of peer acceptance, namely friends' aggressive-disruptive behaviors and school adjustment. However, a significant relationship between friends' aggression-disruptiveness and peer acceptance would have been necessary to support such an explanation, and since the correlation between these variables was null (even in the bivariate analyses), there is little support for the third variable hypothesis.

Limitations. A first limitation of the current study is that several variables that may relate to graduation could not be included in the model. This study focused on peer acceptance and friends' aggression-disruptiveness as key potential predictors of nongraduation. Therefore, other peer-related variables were not addressed here, including victimization by peers, crowd affiliation (i.e., the identification to a reputation-based group of peers like the "popular students," the "druggies," or the "brains"), clique membership (i.e., the association to a group of close friends sharing similar traits, values, and activities), clique-related status (e.g. central or peripheral), friendlessness, and friendship

quality. These variables represent a range of peer experiences that could be related to concurrent and future academic outcomes.

In addition to peer-related variables, family-related variables may also enrich our understanding of the factors that influence graduation outcomes. This study incorporated only family SES. Yet, as suggested by the social interactional perspective, other family variables may influence graduation status, including parental supervision—especially at the time when children enter adolescence and become more independent from parents (Patterson et al., 1992). Other researchers have called attention to the quality of early parenting and home environment (Jimerson et al., 2000) as well as parents' involvement in their children's schooling, expectations for their children's educational attainment, encouragement of the children's achievement, relationships with school staff, and participation in school activities as potential predictors of later academic outcomes (Astone & McLanahan, 1991; Kohl, Lengua, & McMahon, 2000).

The social interactional perspective also suggests that the establishment of a positive relationship with the teacher may contribute to students' school adjustment (Brendgen et al., 2007; Pianta & Stuhlman, 2004). Further, recent reviews point to structural and human characteristics of the school that may influence graduation rates (e.g., school and class size, the availability of alternative academic curricula for potential dropouts, the valuing of work and learning, the adequacy of educative materials, positive relationships among school staff members, parents and students, and the availability of extracurricular activities) (Baker et al., 2001; Rutter & Maughan, 2002). These hypothesized relations are also consistent with the participation-identification view, inasmuch as a positive school climate is thought to encourage active participation in school activities and should make it easier for students to identify with the institution's goals and values (Finn, 1989).

Second, the methodological limitations of this study also deserve some consideration. This study focused on a high-risk population: boys from low-SES, urban

neighborhoods. Although it is important to understand the pathway towards nongraduation taken by these vulnerable students, this limits the generalizability of our findings. More research will be necessary in order to verify whether the current findings are also true for girls, for students of other ethnic groups, for youngsters living in medium-to-high-SES neighborhoods, and for those living in rural or semi-rural areas.

As previously mentioned, the nested structure of our sample (i.e., clusters of students recruited from several schools) raises questions about the comparability of the school experience across participants attending different institutions. The significant intraclass correlations reported in the results section support the idea that school characteristics may, to some extent, influence students' academic achievement, school behaviors, attitudes towards schooling, and, ultimately, their chances of graduating. Future studies involving several schools should therefore include a sufficient number of participants per school so as to allow for a more thorough investigation of the schools' contribution to students' developmental trajectories through multilevel modeling.

In addition, the current study tested a hybrid model based on the combination of sequential and parallel mediation pathways. Such longitudinal studies aid in the elucidation of long-term developmental processes, including those leading to school graduation. Currently, however, bi-directional models (also known as cross-lagged or transactional models) are becoming increasingly popular as researchers recognize that the chain of events leading to a particular developmental outcome is likely to be much more complex than a simple "A causes B which causes C" relationship. Although short-term longitudinal models involving reciprocal effects among variables have been tested (e.g., Welsh et al., 2001), long-term longitudinal models of this kind are still scarce. The database used in the current study did not allow us to test for reciprocal effects because many of the relevant variables were not measured at all developmental periods. Nevertheless, future studies based on more recent datasets can answer important questions regarding the short-term, bi-

directional mediation processes that comprise the larger pathway towards secondary school graduation.

The issue of incomplete data, which is inherent to longitudinal study designs, was addressed in the current study by using all available data over a specific developmental period for most of the variables. More specifically, average scores based on two assessments were used for the variables measured in periods 1 and 2, and average scores based on four assessments were used for the variables measured in period 3. Still, this strategy has its own drawbacks. Although correlations between the scores obtained at different assessments were highly significant, the size of the correlations was quite small for the prosociality measure. Since children's prosociality scores had a general tendency to drop between kindergarten and grade 4, it seems plausible that the measure of prosociality itself was not equally suitable for measuring this variable at both ages—possibly because the behavioral manifestations of prosociality differ in younger and older children. Low correlations were also found for the measure of aggression-disruptiveness in participants' reciprocated friends over a one-year interval. Because this measure was based on peer nominations and standardized within classrooms, the low correlation between the two assessment points probably reflects construct instability—that is, the formation of new friendships with students having different levels of aggression-disruptiveness. Aggregating weakly correlated measurements of the same construct may have negatively affected the power of the SEM analysis.

One last limitation concerns the small effect sizes of the significant indirect pathways. The standardized path coefficients of these indirect pathways were all below .10, which is the benchmark for a small effect size (1988). These small effect sizes were not unexpected given that many mediators were included in the model. Still, every student had his own history of social and academic experiences. Each significant pathway is thus likely to be a worthwhile explanation of the course taken by a small but significant number of individuals during their academic career, so the indirect pathways presented here should

not be dismissed on the single basis of their small effect size. The limited reliability of the scores obtained for some variables (i.e., participants' prosociality and friends' aggression-disruptiveness), as previously discussed, may also have contributed to small effect sizes.

Conclusion. The current study sheds new light on peers' contribution to the developmental pathway leading to nongraduation. In particular, this research highlighted the negative relation between reciprocated friendships with aggressive-disruptive peers and the likelihood of secondary school graduation, which can be attributed to the mediating role of school commitment and academic achievement.

Although the many questions raised in the discussion show that much research still needs to be done in order to achieve a full understanding of the role of peer experiences on the pathway leading to secondary school graduation, the current study can inform the development of experimental prevention programs aimed at promoting secondary school completion. The clear association of early academic failure and behavior problems with secondary school nongraduation suggests that interventions should target the development of social skills and school readiness before school entry (e.g., Schweinhart, Barnes, & Weikart, 1993). Furthermore, experimental prevention programs represent good settings to develop strategies that will help at-risk preadolescent students form and maintain friendships with normative peers, perhaps by teaching at-risk preadolescents more appropriate social skills (Asher, Parker, & Walker, 1996) and by involving at-risk students in extracurricular activities that are supervised by well-trained adults and in which well-adjusted youngsters are also taking part (Silver & Eddy, 2006).

Finally, since not all at-risk students have access to structured prevention programs, parents and teachers should be encouraged to monitor closely the peer relationships of at-risk boys and to offer these students opportunities to make friends with normative, prosocial peers. This might be just what it takes for some students to get on the pathway to secondary school graduation, thereby reducing their risk of future psychosocial maladjustment.

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This manuscript was part of the first author's doctoral dissertation. Its preparation was made possible by a doctoral fellowship awarded to Marie-Hélène Véronneau by the Social Sciences and Humanities Research Council of Canada.

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Footnotes

[1]Several participants were retained in lower grades: the rate of retention was 10.9% by the end of grade 1 and tended to increase in subsequent years. Therefore, to be consistent with the developmental periods being studied, data was gathered for each participant at every year, even for those who were in lower grades. Nevertheless, for the sake of simplicity, only the school grades for participants in age-appropriate classrooms are reported in the measures section.

[2]In contrast with the school systems in other Canadian provinces and in the United States, secondary schooling in the province of Quebec lasts only five years, thus ending in grade 11. As a result, students normally enter secondary school at 12 years old and graduate at 17 years old.

Table 1

Age(s) at Assessment, Indices of Central Tendency, and Distributional Properties of Study Measures

Measure	Age(s) at assessment	N	Mean	SD	Skewness	Kurtosis
Control variables						
SES	6 years	997	38.45	10.70	.82	.21
Academic achievement	7 and 10 years	934	2.03	.87	-.33	-.41
Period 1						
Aggression / disruptiveness	6 and 10 years	997	6.49	5.51	.80	-.17
Prosociality	6 and 10 years	997	7.57	3.90	.23	-.48
Period 2						
Friends' aggression / disruptiveness	11 and 12 years	721	-.06	.74	.59	.05
Peer acceptance	11 and 12 years	924	-.11	1.58	-.18	-.74
Period 3						
School commitment	14 through 17 years	883	17.17	3.25	-.06	-.02
Academic achievement	14 through 17 years	876	1.68	.85	.00	-.25
Period 4						
Nongraduation	23 years	981	.54	.50	-.15	-1.98

Note. When more than one age figures in the column "age(s) at assessment," the mean score over several assessments was used.

Table 2
Bivariate Correlations for All Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Control variables									
(1) SES	--								
(2) Academic achievement	.30***	--							
Period 1									
(3) Aggression / disruptiveness	-.19***	-.35***	--						
(4) Prosociality	.10**	.24***	-.25***	--					
Period 2									
(5) Friends' aggression / disruptiveness	.00	-.08*	.09*	-.09*	--				
(6) Peer acceptance	.15***	.21***	-.25***	.22***	-.01	--			
Period 3									
(7) School commitment	.23***	.24***	-.21***	.19***	-.16***	.12***	--		
(8) Academic achievement	.29***	.46***	-.26***	.13***	-.17***	.14***	.38***	--	
Period 4									
(9) Nongraduation	-.35***	-.54***	.36***	-.18***	.12**	-.18***	-.41***	-.50***	--

Note. Period 1 corresponds to childhood (ages 6 or 7 and 10), period 2 corresponds to preadolescence (ages 11 and 12), period 3 corresponds to adolescence (ages 14 through 17) and period 4 corresponds to early adulthood (age 23). *$p < .05$; **$p < .01$; ***$p < .001$.

Figure Caption

Figure 1. Initial model. Arrows in bold represent the hypothesized indirect (mediation) paths

Figure 2. Final model. Numbers indicate significant standardized covariance estimates. Arrows in bold indicate indirect paths

Figure 1

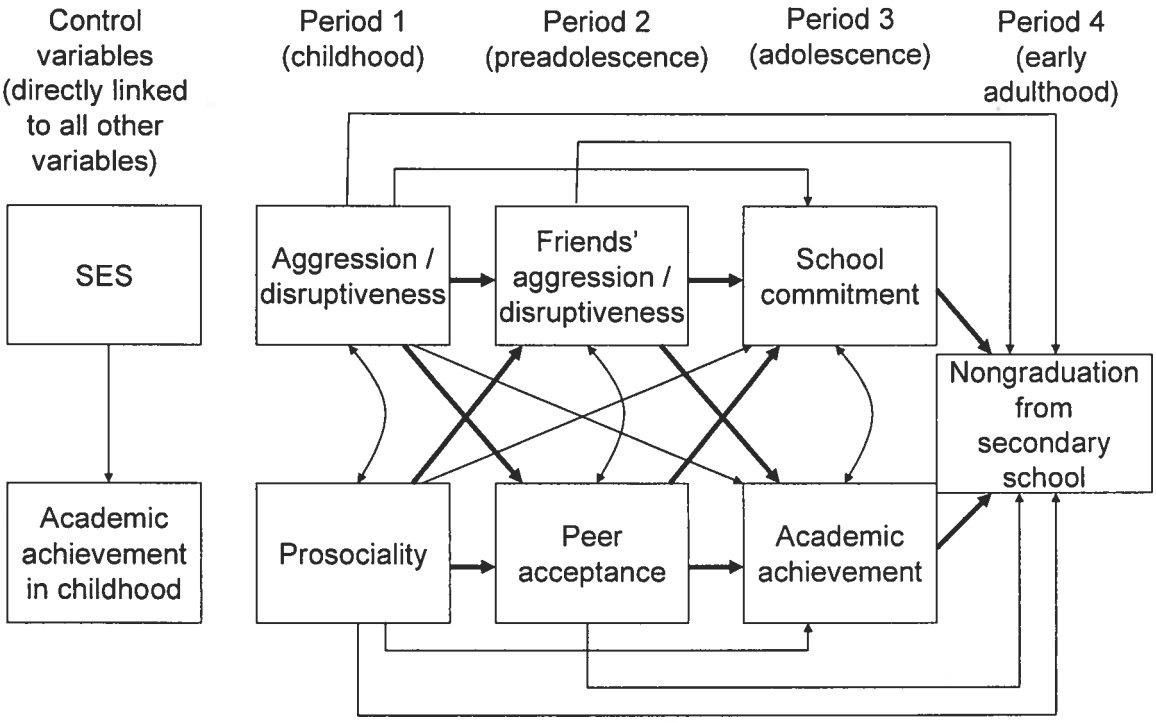
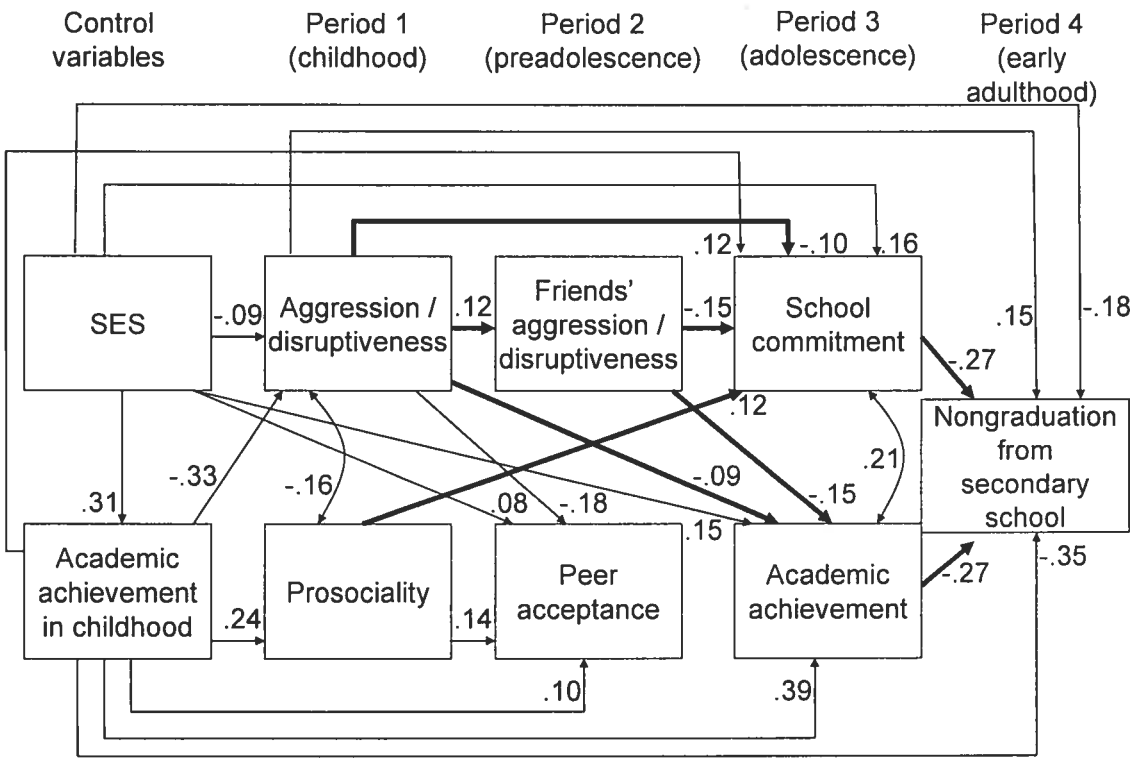

Control variables (directly linked to all other variables)
Period 1 (childhood)
Period 2 (preadolescence)
Period 3 (adolescence)
Period 4 (early adulthood)
SES
Aggression / disruptiveness
Friends' aggression / disruptiveness
School commitment
Nongraduation from secondary school
Academic achievement in childhood
Prosociality
Peer acceptance
Academic achievement

Figure 2


Control variables
Period 1 (childhood)
Period 2 (preadolescence)
Period 3 (adolescence)
Period 4 (early adulthood)
SES
Aggression / disruptiveness
Friends' aggression / disruptiveness
School commitment
Nongraduation from secondary school
Academic achievement in childhood
Prosociality
Peer acceptance
Academic achievement
-.09
.12
-.15
.12
-.10
.16
.15
-.18
-.27
.12
.21
-.09
-.15
.31
-.33
-.16
.08
-.18
.15
-.35
-.27
.24
.14
.10
.39

Article 3— The contribution of peer acceptance and friendship to academic achievement in elementary school: Contrasting parallel and sequential mechanisms

Par Marie-Hélène Véronneau, Frank Vitaro, Mara Brendgen et Richard E. Tremblay

Abstract

This study compared the fit of two models that tested transactional links between peer experiences and academic achievement during elementary school. According to the sequential model, peer acceptance should predict academic achievement only in childhood, whereas reciprocated friendship should predict academic achievement only in adolescence. According to the parallel model, peer acceptance and reciprocated friendship should predict academic achievement throughout childhood and adolescence. Participants (199 girls, 238 boys) were assessed yearly from grade 2 to grade 7. Structural equation modeling analyses revealed that the parallel model had a better fit. Peer acceptance and reciprocated friendship predicted academic achievement over two of the five intervals. Academic achievement also predicted peer acceptance over two intervals and reciprocated friendship over four intervals.

Keywords: Adolescent development, childhood development, friendship, school adjustment, social acceptance.

The contribution of peer acceptance and friendship to academic achievement in elementary school: Contrasting parallel and sequential mechanisms

The elementary school years represent a crucial developmental period in students' lives. In addition to learning the basic academic skills necessary for efficient functioning in everyday life (e.g., reading, writing, arithmetic), young students also learn how to function effectively in a formal social structure outside of the family and in which peers play a central role (Gifford-Smith & Brownell, 2003; Sullivan, 1953). In fact, positive peer experiences are an important correlate of academic achievement (see review by Wentzel, 2005). To date, however, little is known about the independent contribution of group-level and dyadic peer experiences to academic achievement throughout the elementary school years. Furthermore, the reciprocal interplay between peer experiences and academic achievement throughout this period has received very little attention. The present study thus aimed to enhance current knowledge about these issues through the comparison of two competing theoretical models, namely, the sequential model and the parallel model.

Defining Peer Experiences

The various types of experiences children have with peers are usually organized according to one principal criterion. Specifically, experiences are categorized as a function of group processes (e.g., peer group acceptance) or dyadic processes (e.g., having reciprocated friends) (Bukowski & Hoza, 1989; Parker, Rubin, Erath, Wojslawowicz, & Buskirk, 2006; Rubin et al., 1998). This categorization is useful inasmuch as the provisions of group-level versus dyadic-level peer experiences are thought to be only partially overlapping (Furman & Robbins, 1985). As a result, students who are able to maintain positive experiences at both levels are most likely to fulfill all of the socio-affective and instrumental needs that contribute to psychosocial adjustment in general, and to academic achievement in particular. Based on this notion, both group-level (i.e., peer

acceptance) and dyadic-level (i.e., reciprocated friendship) experiences are examined in the current study.

Peer acceptance. Peer acceptance can be defined as the general appreciation of an individual by other members of the peer group (Bukowski et al., 2000). Being well-liked by peers is thought to contribute to academic achievement because well-accepted students may have better access to instrumental aid from the most competent members of the peer group when those students have school-related difficulties (Furman & Robbins, 1985). The satisfaction of their intrinsic need for social connectedness in the school setting may also have a positive impact on these students' levels of motivation and general psychological well-being at school (R. M. Ryan & Deci, 2000). O'Neil, Welsh, Parke, Wang, and Strand (1997) showed that children who were popular in kindergarten had higher grades in the first and second grades, even after controlling for their cognitive abilities. Similar results were obtained by Hatzichristou and Hopf (1996) in a sample of preadolescents.

Reciprocated friendship. In contrast to group-based experiences, dyadic experiences emerge from one-on-one peer interactions. Peer interactions are not all equivalent, however, and those occurring in the context of students' friendships deserve special attention. As reported in Newcomb and Bagwell's meta-analytic review (1995), unilateral friendship nominations have been used in past research on friendship. A shared recognition of the existence of a special link between two individuals, however, is one of the fundamental elements of the friendship relationship (Parker et al., 2006; Rubin et al., 1998).

Several researchers suggested that friendship provides a unique social context for students' social and cognitive development, which cannot be replaced by interactions with adults or neutral (non-friend) peers. For example, Piaget (1975) suggested that students working together on a problem-solving task are more likely to encounter cognitive conflicts than when they are working with an adult (the latter is normally assumed to be right by the child). The discussion undertaken between the two children to solve the conflict contributes to cognitive development (Doise et al., 1975). Further, dyads of neutral

peers are less likely than friends to persevere and achieve a constructive solution when a conflict arises (Fonzi, Schneider, Tani, & Tomada, 1997). Therefore, the friendship relation is thought to be particularly valuable in the context of cognitive development and academic achievement. In line with this notion, Ladd (1990) found that having a larger number of reciprocated friends predicted increases in school achievement over the school year in a sample of kindergarteners. Friendedness was also a correlate of grade point average in a sixth-grade sample (Wentzel et al., 2004).

In sum, both theory and empirical research suggest that peer acceptance and reciprocated friendship should contribute in unique and complementary ways to students' academic achievement (Furman & Robbins, 1985). Gifford-Smith and Brownell (2003) pointed out, however, that our current understanding of the relative contribution of group-level and dyadic peer experiences is still limited because these two constructs have most often been studied separately. Gifford-Smith and Brownell also contended that little attention had been devoted to the topic of the next section, namely, the developmental changes associated with peer experiences.

Are There Critical Periods for the Experience of Peer Acceptance and Reciprocated Friendship?

Because childhood and adolescence are periods of rapid psychological maturation, peer acceptance and reciprocated friendship may differ in relative and absolute importance at different ages during elementary schooling.

The sequential model. According to one perspective, which we will refer to as the sequential model (see Figure 1, top panel), peer acceptance is crucial to psychosocial development during childhood, whereas reciprocated friendship becomes most important in early adolescence. This view was proposed by Sullivan (1953), who argued that peer group acceptance is most important to psychological adjustment in the "juvenile era" (which starts at school entry and lasts until puberty), because children need to feel that they are well-accepted by the peer group in order to develop a sense of personal worth. In

the following "preadolescent" period, having a close, reciprocated friendship (which Sullivan refers to as "chumship") becomes the most important social need, because it provides youngsters an opportunity for self-validation and for learning advanced social skills (see also Furman, 1982). Although the validity of the sequential model for predicting violent delinquency was empirically supported (Vitaro et al., 2007), no empirical validation of this model has been performed with school-related outcomes.

The parallel model. An alternative perspective is offered by the parallel model (see Figure 1, bottom panel), which proposes a more flexible view of the role of peer acceptance and reciprocated friendship at different stages of development. This model was inspired in part by the ideas presented by Buhrmester and Furman (1986), who proposed that the progression from one developmental stage to another does not entail the extinction of pre-existing social needs (e.g., social acceptance by peers) as other needs emerge (e.g., intimate relationship with a reciprocal friend). Recent empirical studies have offered preliminary evidence in favor of a parallel model postulating that both group-level and dyadic peer experiences contribute to academic achievement throughout elementary school. Several studies by Ladd and his colleagues supported the hypothesis that both dyadic and group-level peer experiences are independent predictors of academic achievement as early as kindergarten (Ladd, Birch, & Buhs, 1999; Ladd et al., 1997).

Other studies have provided evidence for the parallel model in early adolescence. For example, the two studies reported by Wentzel and Caldwell (1997) tended to support the idea that both group-level experiences (i.e., peer acceptance and membership in a small group of friends) and dyadic experiences (i.e., reciprocated friendship) are predictors of academic achievement. Bagwell, Schmidt, Newcomb, and Bukowski (2001) also found that both peer rejection and friendedness as measured in early adolescence (grade 5) were associated with educational attainment in young adulthood. In contrast with the sequential model, when both predictors were entered simultaneously in the model, peer rejection, but not friendedness, remained a significant predictor of graduation in this early adolescent sample.

Although there seems to be more empirical evidence in favor of the parallel model when academic outcomes are involved, no study has systematically compared the fit of this model to the fit of the sequential model in the context of academic achievement. Nevertheless, it is necessary to perform such a test in order to verify whether more attention should be devoted to particular types of peer experiences during specific periods of development (as suggested by the sequential model), or if it is relevant to study both group-level and dyadic peer experiences across childhood and adolescence (as proposed by the parallel model).

Current Study

The current study had two main objectives. First, we wanted to assess the relative contribution of peer acceptance and reciprocated friendship to academic achievement from childhood to early adolescence. Second, we wanted to compare the fit of the sequential and parallel models. Based on past studies showing that both peer acceptance and reciprocated friendship as measured in childhood and early adolescence could be significant predictors of academic achievement, we hypothesized that the parallel model (Figure 1, bottom panel) would fit the data significantly better than the sequential model (Figure 1, top panel).

To our knowledge, no study has yet been conducted on the moderating effect of gender with regard to the link between peer acceptance or reciprocated friendship and academic achievement. Therefore, a secondary objective of the current study was to verify whether the link between these variables differed across genders. We put forward the conservative hypothesis that no significant gender differences would emerge.

As can be seen in Figure 1, both the sequential model and the parallel model involved repeated assessments of peer experiences and of academic achievement. These repeated assessments are a crucial feature of the transactional framework proposed by several researchers to study children's psychosocial development (Parker & Asher, 1987; Parker et al., 2006; Rudolph & Asher, 2000). This framework was developed to account

for the fact that human development does not simply occur as a function of environmental influences on the individuals, as the latter also alter their own milieu. As a result, both individuals and their environment are undergoing constant changes. Human development is thus conceptualized as the product of bidirectional and dynamic influences occurring between individuals and their environment. In line with the transactional framework, the two models depicted in Figure 1 present bidirectional (reciprocal) linkages between students' characteristics (i.e., their level of academic achievement) and their experiences within their social milieu (i.e., peer acceptance and reciprocated friendship).

In order to discount alternative interpretations of the findings, should significant links emerge between peer experiences and academic achievement, it appeared necessary to include other established predictors of academic achievement as control variables. For example, it is well-known that aggressive children are more likely to have academic problems and peer difficulties (Graham, Bellmore, & Mize, 2006; Risi et al., 2003; Véronneau, Vitaro, Pedersen, & Tremblay, 2007), and that children living in low socioeconomic status (SES) families are predisposed to academic difficulties (Davis-Kean, 2005). Participants' aggression-disruptiveness and family SES were therefore included as control variables.

Method

Participants

When the study started in the spring of 1986, all French-speaking kindergarteners attending public, elementary schools in a small town (population of 22,000) in northwestern Quebec, Canada, were invited to participate. In the province of Quebec, the transition to secondary school occurs between grade 6 and grade 7. Because of the small size of the town where the study took place, all students attended the same secondary school after the completion of elementary studies.

This longitudinal study spanned eight years from initial recruitment in kindergarten to the last assessment in grade 7; therefore, some students were lost to follow-up prior to the last assessment and new participants were recruited at each wave of assessment. In total, 848 students provided valid data at one or more waves of data collection, but participants needed at least two valid assessments on the repeated measures (i.e., academic achievement, peer acceptance, and reciprocated friendship) and a valid assessment for both control variables (family SES and aggression-disruptiveness) to be included in the analyses. The total number of participants with sufficient valid data was 437, including 199 girls (45.5%).

Because all study variables were measured at every year, it was possible to compare some of the students who were lost to attrition with the 437 remaining participants. After computing average scores based on all available assessments for each study variable, we found that remaining participants had lower levels of aggression-disruptiveness, t (761) = 3.14 $p < .01$, higher levels of socioeconomic status, t (549) = 2.46 $p < .01$, higher levels of academic achievement, t (706) = 3,31, $p < .001$, a larger number of reciprocated friends t (727) = 3.00 $p < .01$, and higher social preference scores t (789) = 3.68 $p < .001$.

Measures

Table 1 shows the descriptive statistics and distributional properties for all measures.

Socioeconomic status. The level of occupational prestige of participants' parents at the time of recruitment (kindergarten) was assessed with the 1981 socioeconomic index for occupations in Canada (Blishen et al., 1987). This index takes into account both the education level and earnings for 514 occupations found in Canada at this time. Scores in the current sample ranged from 18.63 to 72.05, and the average score (45.43, SD = 10.28) was almost equal to the one reported by Blishen et al. (42.74, SD = 13.28) for the Canadian population in general, based on 1981 Census data.

Participants' aggression-disruptiveness. Kindergarten teachers rated participants' levels of aggressive-disruptive behaviors using the French version of the Social Behavior Questionnaire (SBQ: Tremblay et al., 1987). This scale describes 13 aggressive or disruptive behaviors (e.g., "This child bullies", "This child kicks, bites or hits", and "This child is restless and cannot stand still"). Teachers rated the frequency of each behavior on the following scale: 0 (never), 1 (sometimes) or 2 (often). Cronbach's alpha for this scale was .91. A square root transformation was performed on this scale, because of its positive skewness (1.52, SE = .13) and kurtosis (1.89, SE = .25). After this transformation, total scores ranged from 0 to 4.90. The distributional properties of the transformed variable were satisfactory (see Table 1).

Academic achievement. Every year from grade 2 through grade 7, teachers reported on participants' global academic achievement in all academic subjects on a scale ranging from 1 (academic failure) to 5 (excellent academic performance).

Peer acceptance. Social preference scores were used to measure peer acceptance. Every year from grade 2 through grade 7, participants and their classmates were provided with a list of all students in their classroom. Positive nominations were gathered by asking students to circle the names of the four classmates they liked most. Students were also asked to circle the names of the four classmates they liked least, thereby yielding negative nominations. The number of positive and negative nominations were calculated for each child and standardized within classrooms. In line with recommendations by Coie, Dodge, and Coppotelli (1982), scores of social preference were attributed to participants based on the difference between the number of positive and negative nominations they obtained, which was again standardized within classroom.

Reciprocated friendship. During the peer-nomination procedure, participants were also asked to circle the name of up to four classmates whom they considered to be their best friends. Participants who nominated one another on this item were identified as reciprocated friends. The number of reciprocated friends ranged from 0 to 4.

Procedure

After the institutional review board had approved all instruments used at each year of data collection, parental permission was obtained through letters distributed by the teachers. Parents were asked to fill out a questionnaire which they returned to the investigators by mail. Peer nominations and teacher ratings were collected in school. Research assistants explained the study to the participants. The students were informed that they had the right to refuse participating and that all responses would remain confidential. Teachers were asked to leave the classroom while the peer nomination procedure was taking place. During this time, teachers filled out questionnaires about the participating children.

Results

Bivariate correlations

Table 2 presents the bivariate correlations among gender, control variables (SES and participants' aggression-disruptiveness) as measured in kindergarten, and the peer and achievement variables (peer acceptance, reciprocated friendship, and academic achievement) as measured in grade 2. Significant relations involving gender were found. Compared to boys, girls were less aggressive-disruptive, they had higher academic achievement, higher peer acceptance, and more reciprocated friends. Family SES was positively related to academic achievement and peer acceptance, but unrelated to levels of aggression-disruptiveness and to the number of reciprocated friends. Aggression-disruptiveness was negatively related to academic achievement, peer acceptance, and the number of reciprocated friends.

Table 3 presents the bivariate correlations among the primary study variables across all times. This table provides preliminary support for the hypothesis that peer experiences are related to changes in academic achievement. Not only were peer acceptance and the number of reciprocated friends concurrently related to academic

achievement; they were also significantly related to academic achievement in the following year (with only one exception for peer acceptance in grade 6 and academic achievement in grade 7, r = .08, *ns*). There is also preliminary support for the reverse process, as academic achievement was significantly related to peer acceptance and to the number of reciprocated friends in the following year (with only one exception for academic achievement in grade 6 and peer acceptance in grade 7, r = .09, *ns*).

Model testing

Comparing the competing models. SEM analyses (Bollen, 1989) were used to assess the fit of the two competing models presented in Figure 1 (i.e., the sequential model and the parallel model). In addition to the paths presented in this figure, autocorrelations among repeated assessments of the peer acceptance and academic achievement variables over two-year intervals were estimated, because strong autocorrelations were found over this interval in preliminary analyses. For the sake of simplicity, however, these autocorrelations over two-year intervals are not shown in Figure 1. Autocorrelations over longer intervals and transactional paths for the two control variables were not included in order to avoid making the models too complex.

When running SEM analyses, it is possible to include all participants with complete data on exogenous variables and on the grouping variable (i.e., gender), even if there are incomplete data on the other (endogenous) variables. In the present study, the gender of all participants was known. The exogenous variables were the two control variables, namely, aggression-disruptiveness and SES as measured in kindergarten. Although only 317 participants had complete data on these two variables, later assessments of SES and aggression-disruptiveness during elementary school years were used to generate plausible estimates to replace missing values on these crucial variables, through a multiple imputation procedure (Allison, 2003). The final sample thus comprised 437 participants.

For the SEM analyses, the full information maximum likelihood method was used to manage missing values on endogenous variables (Allison, 2003). With this method, the

covariance matrix used to estimate model parameters is constructed from all available information for each participant, so that occasional incomplete data on endogenous variables is not problematic. Nevertheless, including participants with too many missing values is not advisable; for this reason, only participants with at least two valid assessments for each of the three repeated variables (peer acceptance, reciprocated friendship, and academic achievement) were retained for the remaining analyses.

All SEM analyses were conducted with M*plus* 3.12 (Muthén & Muthén, 2004) using maximum likelihood estimation. Table 4 presents fit indices for the different models that were tested, as well as the results of chi-square difference tests used to verify the difference of fit between competing models.

First, we verified which one of the two models (parallel versus sequential) was the better fit to the data. The fit of the sequential model (Figure 1, top panel) was acceptable according to most indices, CFI = .93; TLI = .92; RMSEA = .05. The fit of the parallel model (Figure 1, bottom panel) was slightly better than for the sequential model, CFI = .95; TLI = .94; RMSEA = .04. Since the two models were nested, a chi-square difference test was performed in order to compare their fit. In line with our hypothesis, a significant difference emerged in favor of the parallel model, χ^2 (7) = 53.97; $p < .001$.

Because we had initially hypothesized that the relations between academic achievement and peer experiences would not differ across genders, the path coefficients of the parallel and sequential models were constrained to be equal for girls and boys. In order to test for the validity of this assumption, a parallel model in which path coefficients were unconstrained across genders was tested next, and the chi-square difference test was used to determine whether the unconstrained model fit the data significantly better than the constrained model. No significant difference was found, χ^2 (77) = 73.75; *ns*. Therefore, the more parsimonious model, in which path coefficients were constrained to be equal across genders, was preferred over the unconstrained model. The most important paths of the final model (i.e., the parallel model) are presented in Figure 2. Table 5 presents the

coefficients and levels of significance for all estimated paths. The following sections highlight important aspects of the final model.

Control variables. As predicted, participants' aggression-disruptiveness was negatively related to their peer acceptance and academic achievement. The link between aggression-disruptiveness and reciprocated friendship was not significant, however. Similarly, family SES was positively related to peer acceptance and academic achievement, but unrelated to reciprocated friendship.

Associations between concurrent measures. Significant concurrent associations were found at all assessment times between peer acceptance and reciprocated friendship, but concurrent associations between academic achievement and the two peer-related variables were significant only in grades 2 and 3.

Cross-lagged associations. The most theoretically relevant paths were the cross-lagged associations from peer-related variables to academic achievement. Significant cross-lagged associations from peer acceptance to academic achievement in the next year emerged over two intervals, namely from grade 3 to grade 4, and from grade 4 to grade 5. Similarly, cross-lagged associations from reciprocated friendship to academic achievement in the next year emerged over two intervals, that is, from grade 3 to grade 4, and from grade 5 to grade 6.

In order to verify whether the significant cross-lagged paths were part of a truly transactional process (i.e., the variables that are shaped by the predictors will, in turn, influence those predictors), we also estimated the paths from academic achievement to peer acceptance and from academic achievement to reciprocated friendship. In support of the transactional model, significant cross-lagged associations from academic achievement to peer acceptance in the next year emerged over two intervals, that is, from grade 2 to grade 3, and from grade 4 to grade 5. Furthermore, significant cross-lagged paths from academic achievement to reciprocated friendship emerged over all intervals, except for the interval from grade 3 to grade 4.

Discussion

The current study had two main objectives. First, we wanted to test the hypothesis that peer experiences at the group level (as represented by peer acceptance) and at the dyadic level (as represented by reciprocated friendship) were independent predictors of academic achievement during childhood and early adolescence. The emergence of significant links between peer acceptance and academic achievement and between reciprocated friendship and academic achievement over two intervals during this time period supported our hypothesis.

The second objective of this study was to compare the fit of two theoretically plausible transactional models, namely the sequential model and the parallel model. Consistent with our hypothesis, the parallel model fit the data significantly better than the sequential model.

As a secondary objective of this research, we wanted to verify whether reciprocal, cross-lagged relationships between academic achievement and peer experiences would differ across genders. Again, consistent with our hypothesis, the parallel model in which path coefficients were free to vary for boys and girls did not fit the data significantly better than an identical model in which these parameters were constrained to be equal across genders. This finding suggests that the parallel model fits equally well for girls and boys. Further examination of the significant and non-significant paths in the final model suggests, however, that the current findings need to be interpreted with caution, because not all hypothesized links emerged.

Concurrent Associations

In line with previous research (e.g., Ladd et al., 1997; Parker & Asher, 1993b; Wentzel & Caldwell, 1997), a positive link was found between concurrent measures of peer acceptance and reciprocated friendship at each point of assessment. This result supports the idea that group-level and dyadic experiences must both be taken into account

when studying peers' contributions to child and adolescent development so as to avoid confounding the contribution of one type of peer experiences with the other.

Although concurrent associations between peer experiences and academic achievement were only significant in grades 2 and 3, several cross-lagged associations between peer experiences and academic achievement emerged after grade 2. The contrast between the number of significant cross-lagged relationships and non-significant concurrent associations provides some support for the hypothesis that causal processes may be involved. In fact, the time lag which is expected to occur before social processes translate into academic outcomes does manifest itself, while the alternative spurious explanation, in which peer experiences and academic outcomes would be the consequences of third variables, is not well supported because several concurrent associations are not significant.

Cross-Lagged Paths from Peer Acceptance to Academic Achievement

As predicted, significant paths from peer acceptance to academic achievement emerged between grades 3 and 4, as well as between grades 4 and 5. However, cross-lagged paths were non-significant over the first (from grade 2 to grade 3) and the last two intervals (from grade 5 to grade 6, and from grade 6 to grade 7). One explanation for a non-significant path over the first interval would be that academic achievement over this period was more stable than over any other interval. This leaves less variance to be explained by other variables in the model. This hypothesis seems less plausible for the last two intervals, however, since academic achievement was not particularly stable between grades 5, 6 and 7. Consequently, other explanations need to be explored.

As previously mentioned, students transferred to secondary school between grades 6 and 7. This transition usually involves many changes, and several unmeasured factors caused by the school transition itself may have contributed to students' school adjustment. For example, establishing a positive relationship with teachers, developing a sense of belonging to the secondary school institution, adapting to new academic subjects, and to a

different physical environment are challenges that are triggered by the school transition itself and that may, as a whole, explain more variance in academic achievement than the peer experiences one year earlier in elementary school. Nevertheless, these explanations can only account for the absence of a significant cross-lagged path over the last interval. Other possibilities must be explored to explain the non-significant path over the grade 5 to grade 6 interval. Some arguments taken from the sequential model may apply here. More precisely, social acceptance by peers might not be as important with regard to the general psychological adjustment of students after they have achieved a certain level of maturation in their understanding of social processes. Consistent with this hypothesis, Gifford-Smith and Brownell (2003) proposed that early adolescents might come to consider that maintaining positive relationships with a smaller group of well-chosen peers is more advantageous than being well-liked by classmates in general. In fact, this strategy may be superior to maintaining high levels of peer acceptance in the larger group when it comes to finding appropriate help from peers in order to perform well at school.

These hypotheses about the relative importance of different types of group-level experiences in early adolescence have received preliminary support from Wentzel and Caldwell (1997), who found that membership in a small group of friends in grade 6 was a more consistent predictor of academic achievement in grades 6, 7 and 8 than was peer acceptance (in contrast to the current study, these participants attended a middle school where they completed grades 6 through 8). In addition, Schwartz, Gorman, Nakamoto, and McKay (2006) found that social acceptance was not a significant predictor of adolescents' academic achievement when taking into account peer-rated aggression and peer-perceived popularity.

Cross-Lagged Paths From Reciprocated Friendship to Academic Achievement

As previously mentioned, academic achievement was particularly stable over the first interval, and this is a possible explanation for the non-significant path from reciprocated friendship in grade 2 to academic achievement in grade 3. As academic

achievement is much less stable over the last interval (from grade 6 to grade 7), we suggest that changes in social needs during early adolescence, and especially during the transition to secondary school, may account for the non-significant path over this interval. For example, having supportive friendships or becoming friends with well-adapted classmates may be more important than having many friends for students experiencing the transition to secondary school.

Developmental considerations cannot be invoked, however, to explain the absence of a link between reciprocated friendship and academic achievement in the interval between grade 4 and grade 5, as significant paths were found for the preceding and the following intervals. Rather, it is possible that the time period between assessments was not ideal to detect transactional processes involving dyadic peer experiences such as reciprocated friendship. In fact, these experiences are likely to be more dynamic than group-level experiences like peer acceptance, as they are shaped by everyday interactions rather than by some consensual opinion of the peer group. In line with this notion, autocorrelations for repeated assessments of the reciprocated friendship over one-year intervals were much smaller than those found for the peer acceptance variable. This suggests that the cross-lagged paths from reciprocated friendship to academic achievement might have been stronger and more consistent across assessments had the measurement interval been shorter. The ideal time frame for measuring changes in reciprocated friendships is not known yet, but Berndt (1996) suggested that a good strategy might be to conduct two assessments within the same school year—although this strategy may backfire if little change occurs during this period.

Cross-Lagged Paths From Academic Achievement to Peer Acceptance

Academic achievement was a significant predictor of peer acceptance over two intervals (i.e., from grade 2 to grade 3, and from grade 4 to grade 5), but this relationship then vanished. Therefore, although high achieving students tend to have more reciprocated friends over time (as will be discussed next), they do not tend to be sought-after when children are asked to nominate the students they like the most. Current findings suggest

that younger children might be more influenced by adults' explicit valuation of high achieving students when they make their positive peer nominations, whereas other personal qualities may come into play when young adolescents are asked to make similar nominations. In fact, students who get high scores of peer acceptance are likely to display several other personal qualities than being good at school; for example, they tend to be more sociable and less aggressive than most of their peers (Newcomb, Bukowski, & Pattee, 1993). There could be a diversification of the determinants of positive peer nominations as students' capacity for multidimensional reasoning develops (Keating, 1990).

Cross-Lagged Paths from Academic Achievement to Reciprocated Friendship

Academic achievement was a consistent predictor of reciprocated friendship, as significant cross-lagged paths emerged at all intervals, except from grade 3 to grade 4. One explanation for this finding could be that high achieving students are generally well-adapted youngsters who present not only good academic skills, but also good interpersonal skills that facilitate the initiation and maintenance of reciprocated friendship, as suggested by Berndt (1989) and by Wentzel (2005). Therefore, although we did control for some potentially confounding variables (i.e., SES and aggressive-disruptive behaviors), there could be a third-variable effect from an unmeasured variable (i.e., the level of general socio-cognitive skills) which would account for the observed relationship between academic achievement and the number of reciprocated friends.

The comparison of this finding with results involving academic achievement and peer acceptance one year later suggest that although high achieving students are not those who receive the largest number of positive nominations from their peers in general, they do tend to have more reciprocated friends than other students. In fact, by becoming friends with high achieving peers, students who wish to do well in school would thereby gain access to good advice and effective help with their schoolwork. It is possible that, through selection processes (Kandel, 1978), high achieving peers aggregate into small cliques of

close friends who nominate one another as best friends year after year. In this context, it is noteworthy that the link between academic achievement in grade 6 and reciprocated friendship in grade 7 was the only significant cross-lagged path over the last interval. It appears that at the time of the transition from elementary to secondary school, students try to remain friends with peers who are most likely to offer them reliable academic support.

Cross-Lagged Paths Involving Peer Acceptance and Reciprocated Friendship

Higher levels of peer acceptance were related to increases in the number of reciprocated friends over all intervals except the last one, when students transferred to secondary school. Therefore, in line with previous findings (e.g., Bukowski, Pizzamiglio, Newcomb, & Hoza, 1996), it seems that having a good reputation in the larger peer group helps students to make new friends. The fact that the peer group composition changes drastically in secondary school might explain why previous levels of peer acceptance are unrelated to reciprocated friendship over the last interval. In contrast, the reverse process, in which reciprocated friendship would predict increases in peer acceptance, was observed over only one interval (i.e, between grade 3 and grade 4). This suggests that making a good impression on classmates in general (as revealed by the peer acceptance score) is usually not influenced by the number of reciprocated friends one student has. In line with this notion, previous research suggests that friends' characteristics play a more important role in this context than the mere number of reciprocated friends. For example, Sabongui, Bukowski, and Newcomb (1998) found that having popular friends contributes to an increase in students' popularity within their peer group.

Strengths and Limitations

The current study presents important strengths over previous research on peer experiences as predictors of academic achievement. First, this study was guided by a transactional perspective of child and adolescent development. This perspective offers a realistic picture of the complex and dynamic processes shaping the development of

children and early adolescents because it acknowledges that individuals are not merely influenced by their social milieu; they also contribute to shape their own environment. Second, the inclusion of two levels of peer experiences within the model (i.e., group-level and dyadic experiences) contributed to our understanding of their relative contribution to students' academic achievement. Third, the longitudinal design of the current study, which involved six yearly assessments, allowed us to examine developmental changes over childhood and early adolescence. Since the publication of Sullivan's interpersonal theory (1953), several theorists have insisted on the importance of the timing of peer relationships during these two developmental periods (Buhrmester & Furman, 1986; Patterson et al., 1989). The current results supported the parallel model over the sequential model, suggesting that researchers should assess group-level as well as dyadic peer experiences both in childhood and early adolescence if they wish to study the association between peer experiences and students' academic adjustment.

In spite of its strengths, the current study also had some limitations. First, although two developmental periods were covered (i.e., childhood and early adolescence), upward and downward extensions of the time frame would have yielded a more complete picture of the developmental processes involved. Second, a thorough understanding of the dynamic processes underlying school adjustment likely involves the assessment of some psychological variables in addition to the familial, behavioral, academic and social variables included in the current study. Notably, in his participation-identification model, Finn (1989) suggested that for most students, academic success is achieved through active involvement in the learning activities proposed by the school. Being involved in school activities and being rewarded for this involvement by achieving satisfactory academic results contributes to students' identification with school, which can be defined as the internalization by the student of the school's values. Thus, school identification is the psychological consequence of positive academic experiences. Negative peer experiences, however, could disrupt the participation-identification cycle experienced by students. For example, Véronneau et al. (2007) found that associating with aggressive-disruptive friends in preadolescence predicted lower school commitment and achievement in adolescence.

Therefore, psychological aspects of the process of academic adjustment could be assessed in future studies with a measure of school motivation or a measure of students' identification with the school's values.

An additional limitation is that other types of peer experiences that could provide a richer understanding of the processes influencing to students' academic achievement were not included in the current study. Future research should include a wider variety of peer experiences, both at the group level and at the dyadic level. With regard to group-level experiences, we suggest that membership in a smaller social network, especially when students enter adolescence, could be a powerful predictor of academic achievement. We further propose that students' position within such a network (e.g., central versus peripheral) could also be related to their academic achievement (R. Cairns, Xie, & Leung, 1998; Gest, Graham-Bermann, & Hartup, 2001). At the same time, richer assessments of dyadic experiences could be designed based on the comprehensive view of friendship proposed by Hartup (1996). Friends' characteristics should be taken into account, as well as the characteristic of the relationship itself. An assessment of the micro-social processes occurring in the course of students' interactions with their friends, neutral peers, or enemies may also contribute to a better understanding of peers' contribution to students' school adjustment.

In conclusion, the current study is the first to provide an empirical test of two important theoretical perspectives on the contribution of different types of peer experiences to students' academic achievement throughout most of elementary school years. The fit of the parallel model was significantly better than the fit of the sequential model. This suggests that both group-level and dyadic peer experiences are likely to play a role in the process of school adjustment throughout early and late elementary school years. Therefore, future studies on this topic should assess both types of peer experiences at all ages. Another important finding of the current study is the emergence of bidirectional links between peer experiences and academic achievement, as this supported the validity of the transactional framework proposed by Parker et al. (2006) for studying the reciprocal influences between students and their social milieu during elementary school years.

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Preparation of this manuscript was made possible by three fellowships awarded to Marie-Hélène Véronneau: one by the Social Sciences and Humanities Research Council of Canada, another by the Sainte-Justine Hospital Foundation and the Foundation for Research into Children's Diseases, and the last one by the Department of Psychology, Université de Montréal.

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Table 1

Indices of Central Tendency and Distributional Properties of Study Measures

Measure	N	Mean	SD	Skewness	Kurtosis
Control variables					
SES	437	45.43	10.28	.23	-.43
Aggression-disruptiveness	437	1.50	1.19	.48	-.28
Academic achievement					
Grade 2	282	3.27	1.01	.02	-.26
Grade 3	350	3.13	1.02	.15	-.15
Grade 4	298	3.23	1.02	-.03	-.13
Grade 5	312	3.33	1.06	.05	-.72
Grade 6	354	3.40	1.06	-.42	-.12
Grade 7	301	3.38	1.05	-.09	-.41
Peer acceptance					
Grade 2	349	.11	.95	-.19	.46
Grade 3	384	.12	.95	-.39	-.10
Grade 4	396	.07	.95	-.36	.16
Grade 5	319	.05	.98	-.57	.10
Grade 6	351	.00	.98	-.56	.25
Grade 7	357	.04	.96	-.45	.41
Reciprocated friendship					
Grade 2	337	1.33	1.00	.25	-.99
Grade 3	360	.99	1.11	.97	.11
Grade 4	361	1.19	1.15	.60	-.71
Grade 5	319	1.65	1.23	.26	-.90
Grade 6	350	1.58	1.22	.41	-.70
Grade 7	357	1.32	1.12	.47	-.57

Table 2

Bivariate Correlations Among Control Variables and the Main Predictors as Measured in Grade 2

	(1)	(2)	(3)	(4)	(5)	(6)
(1) Gender	--					
(2) SES	.03	--				
(3) Aggression-disruptiveness	-.26***	-.02	--			
(4) Academic achievement	.16**	.24***	-.20***	--		
(5) Peer acceptance	.12*	.13*	-.29***	.44***	--	
(6) Reciprocated friendship	.11*	.08	-.11*	.30***	.53***	--

Note. * $p < .05$; ** $p < .01$; *** $p < .001$. For the gender variable 0 = boy and 1 = girl.

Table 3
Bivariate Correlations Among the Main Predictors Across All Assessments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Peer acceptance																		
(1) Grade 2	--																	
(2) Grade 3	.53	--																
(3) Grade 4	.42	.50	--															
(4) Grade 5	.48	.57	.55	--														
(5) Grade 6	.34	.44	.46	.54	--													
(6) Grade 7	.19	.26	.32	.40	.51	--												
Reciprocated friendship																		
(7) Grade 2	.53	.28	.25	.29	.18**	.19**	--											
(8) Grade 3	.33	.48	.38	.33	.26	.25	.18**	--										
(9) Grade 4	.33	.31	.47	.29	.22	.13*	.24	.31	--									
(10) Grade 5	.25	.35	.32	.58	.30	.28	.21	.30	.23	--								
(11) Grade 6	.29	.27	.30	.26	.55	.30	.14*	.27	.21	.17**	--							
(12) Grade 7	.17**	.16**	.18	.25	.20	.34	.15**	.19	$.05^{ns}$	.13*	.22	--						
Academic Achievement																		
(13) Grade 2	.44	.36	.30	.33	.16*	$.11^{m}$	.30	.28	.23	.25	.22	.29	--					
(14) Grade 3	.30	.43	.29	.37	.20	$.08^{ns}$	.19	.39	.23	.28	.23	.29	.63	--				
(15) Grade 4	.32	.43	.32	.38	.17**	$.12^{m}$	.20	.40	.25	.34	.25	.35	.56	.62	--			
(16) Grade 5	.32	.41	.34	.33	.18**	$.09^{ns}$	.24	.38	.26	.25	.20	.25	.60	.60	.65	--		
(17) Grade 6	.26	.33	.25	.29	.24	$.09^{ns}$	$.09^{ns}$	.32	.19	.31	.22	.22	.59	.55	.56	.71	--	
(18) Grade 7	.37	.35	.27	.26	$.08^{ns}$	$.11^{m}$	.18**	.31	.19**	.17**	.14*	.22	.47	.49	.48	.57	.55	--

Note. All correlations are significant at $p < .001$, except when otherwise indicated, $^{m}p < .10$; * $p < .05$; ** $p < .01$

Table 4

Fit Indices of the Models Tested and Results of Chi-Square Difference Tests

Models and difference tests	χ^2	*df*	*p*	CFI	TLI	RMSEA
1. Comparison of the parallel vs sequential models (path coefficients constrained across gender)						
A. Sequential model	467.86	308	.001	.93	.92	.05
B. Parallel model	413.89	301	.001	.95	.94	.04
C. χ^2 Difference test (parallel vs sequential)	53.97	7	.001	--	--	--
2. Comparison of the parallel model with path coefficients constrained across gender vs path coefficients unconstrained across gender						
A. Parallel model, *B* constrained across gender	413.89	301	.001	.95	.94	.04
B. Parallel model, *B* unconstrained across gender	340.14	224	.001	.95	.92	.05
C. χ^2 Difference test (constrained vs unconstrained)	73.75	77	*ns*	--	--	--

Note. The final model is the parallel model with path coefficients constrained to be equal across gender (as presented in 1-B and 2-A).

Table 5

Standardized Coefficients and Significance Levels for All Estimated Paths in the Final Model

Estimated paths	β	*p*
A. Paths from control variables		
Aggression-disruptiveness → Academic achievement	-.21	.001
Aggression-disruptiveness → Peer acceptance	-.29	.001
Aggression-disruptiveness → Reciprocated friendship	-.08	*ns*
Family SES → Academic achievement	.22	.001
Family SES → Peer acceptance	.10	.05
Family SES → Reciprocated friendship	.07	*ns*
B. Paths for repeated measures, one-year intervals		
Academic achievement grade 2 → Academic achievement grade 3	.59	.001
Academic achievement grade 3 → Academic achievement grade 4	.35	.001
Academic achievement grade 4 → Academic achievement grade 5	.38	.001
Academic achievement grade 5 → Academic achievement grade 6	.59	.001
Academic achievement grade 6 → Academic achievement grade 7	.24	.001
Peer acceptance grade 2→ Peer acceptance grade 3	.43	.001
Peer acceptance grade 3→ Peer acceptance grade 4	.31	.001
Peer acceptance grade 4→ Peer acceptance grade 5	.34	.001
Peer acceptance grade 5→ Peer acceptance grade 6	.48	.001
Peer acceptance grade 6→ Peer acceptance grade 7	.41	.001
Reciprocated friendship grade 2 → Reciprocated friendship grade 3	-.01	*ns*
Reciprocated friendship grade 3 → Reciprocated friendship grade 4	.17	.01
Reciprocated friendship grade 4 → Reciprocated friendship grade 5	.06	*ns*
Reciprocated friendship grade 5 → Reciprocated friendship grade 6	.04	*ns*
Reciprocated friendship grade 6 → Reciprocated friendship grade 7	.14	.05
C. Paths for repeated measures, two-year intervals		
Academic achievement grade 2 → Academic achievement grade 4	.28	.001
Academic achievement grade 3 → Academic achievement grade 5	.33	.001
Academic achievement grade 4 → Academic achievement grade 6	.18	.01

Academic achievement grade 5 → Academic achievement grade 7	.43	.001
Peer acceptance grade 2→ Peer acceptance grade 4	.20	.001
Peer acceptance grade 3→ Peer acceptance grade 5	.31	.001
Peer acceptance grade 4→ Peer acceptance grade 6	.16	.001
Peer acceptance grade 5→ Peer acceptance grade 7	.14	.001
D. Correlations between concurrent measures		
Grade 2		
Peer acceptance / Academic Achievement	.32	.001
Peer acceptance / Reciprocated friendship	.50	.001
Academic achievement / Reciprocated friendship	.26	.001
Grade 3		
Peer acceptance / Academic Achievement	.17	.001
Peer acceptance / Reciprocated friendship	.28	.001
Academic achievement / Reciprocated friendship	.20	.001
Grade 4		
Peer acceptance / Academic Achievement	.02	*ns*
Peer acceptance / Reciprocated friendship	.27	.001
Academic achievement / Reciprocated friendship	.01	*ns*
Grade 5		
Peer acceptance / Academic Achievement	-.03	*ns*
Peer acceptance / Reciprocated friendship	.31	.001
Academic achievement / Reciprocated friendship	-.05	*ns*
Grade 6		
Peer acceptance / Academic Achievement	.05	*ns*
Peer acceptance / Reciprocated friendship	.37	.001
Academic achievement / Reciprocated friendship	.02	*ns*
Grade 7		
Peer acceptance / Academic Achievement	.06	*ns*
Peer acceptance / Reciprocated friendship	.22	.001
Academic achievement / Reciprocated friendship	.07	*ns*
E. Paths from peer acceptance		

Peer acceptance grade 2→ Academic achievement grade 3	.08	*ns*
Peer acceptance grade 3→ Academic achievement grade 4	.12	.05
Peer acceptance grade 4→ Academic achievement grade 5	.13	.01
Peer acceptance grade 5→ Academic achievement grade 6	-.02	*ns*
Peer acceptance grade 6→ Academic achievement grade 7	-.04	*ns*
Peer acceptance grade 2→ Reciprocated friendship grade 3	.25	.001
Peer acceptance grade 3→ Reciprocated friendship grade 4	.21	.01
Peer acceptance grade 4→ Reciprocated friendship grade 5	.23	.001
Peer acceptance grade 5→ Reciprocated friendship grade 6	.23	.01
Peer acceptance grade 6→ Reciprocated friendship grade 7	.07	*ns*
F. Paths from reciprocated friendship		
Reciprocated friendship grade 2→ Academic achievement grade 3	-.02	*ns*
Reciprocated friendship grade 3→ Academic achievement grade 4	.14	.01
Reciprocated friendship grade 4→ Academic achievement grade 5	.03	*ns*
Reciprocated friendship grade 5→ Academic achievement grade 6	.14	.01
Reciprocated friendship grade 6→ Academic achievement grade 7	.02	*ns*
Reciprocated friendship grade 2→ Peer acceptance grade 3	-.01	*ns*
Reciprocated friendship grade 3→ Peer acceptance grade 4	.13	.01
Reciprocated friendship grade 4→ Peer acceptance grade 5	-.02	*ns*
Reciprocated friendship grade 5→ Peer acceptance grade 6	-.02	*ns*
Reciprocated friendship grade 6→ Peer acceptance grade 7	.04	*ns*
G. Paths from academic achievement		
Academic achievement grade 2→ Peer acceptance grade 3	.17	.001
Academic achievement grade 3→ Peer acceptance grade 4	.04	*ns*
Academic achievement grade 4→ Peer acceptance grade 5	.14	.01
Academic achievement grade 5→ Peer acceptance grade 6	.00	*ns*
Academic achievement grade 6→ Peer acceptance grade 7	-.08	*ns*
Academic achievement grade 2→ Reciprocated friendship grade 3	.18	.01
Academic achievement grade 3→ Reciprocated friendship grade 4	.10	*ns*
Academic achievement grade 4→ Reciprocated friendship grade 5	.26	.001

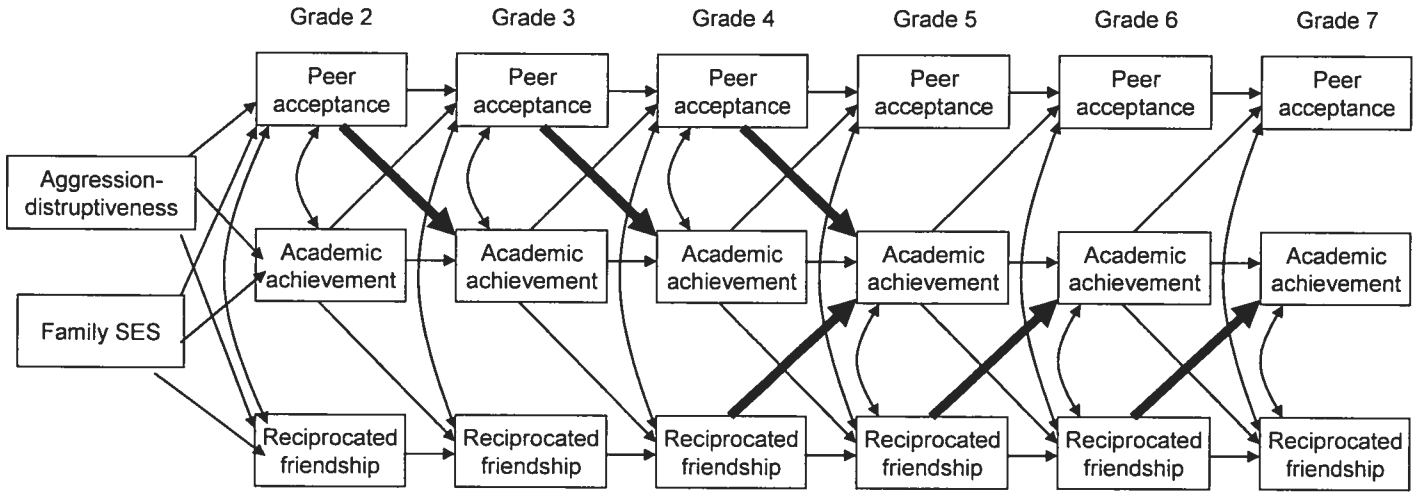
Academic achievement grade 5→ Reciprocated friendship grade 6	.16	.01
Academic achievement grade 6→ Reciprocated friendship grade 7	.17	.01

Figure Caption

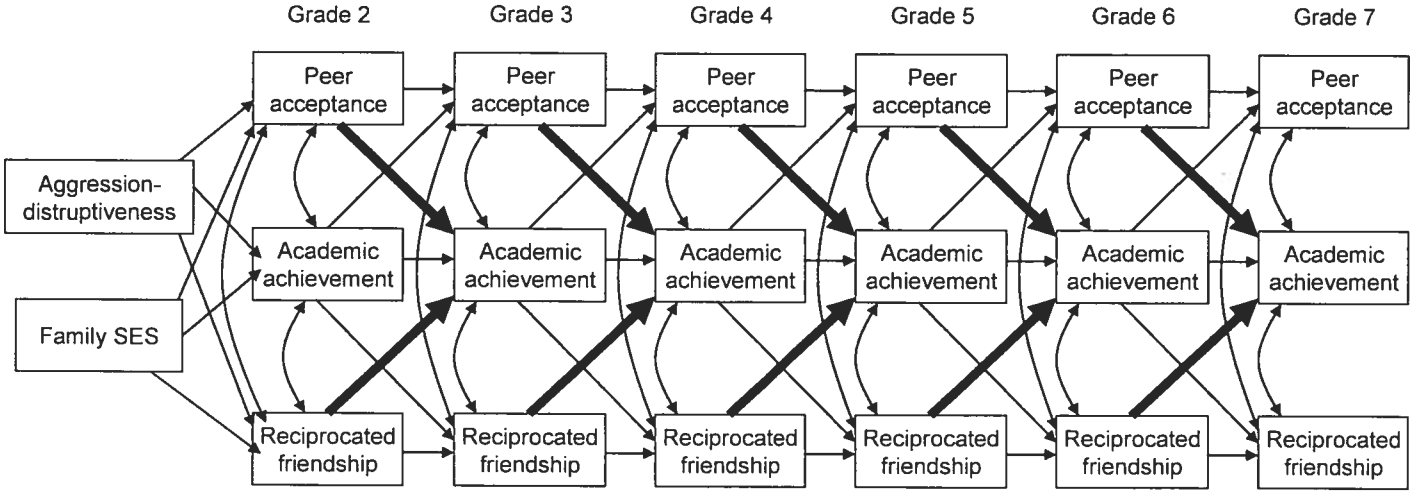
Figure 1. The sequential model (top panel) and the parallel model (bottom panel). For the sake of parsimony, two-year autocorrelations (only for peer acceptance and academic achievement) are not presented in the figure.

Figure 2. The final model: a parallel model with path coefficients constrained to equality across genders (Peer acc = Peer acceptance; Acad ach = Academic achievement; Recip frien = Reciprocated friendship). For the sake of parsimony, two-year autocorrelations (only for peer acceptance and academic achievement) are not presented in the figure. For the same reason, concurrent correlations between peer acceptance and reciprocated friendships are not presented. See Table 5 for the list of all significant and non-significant paths.

Figure 1

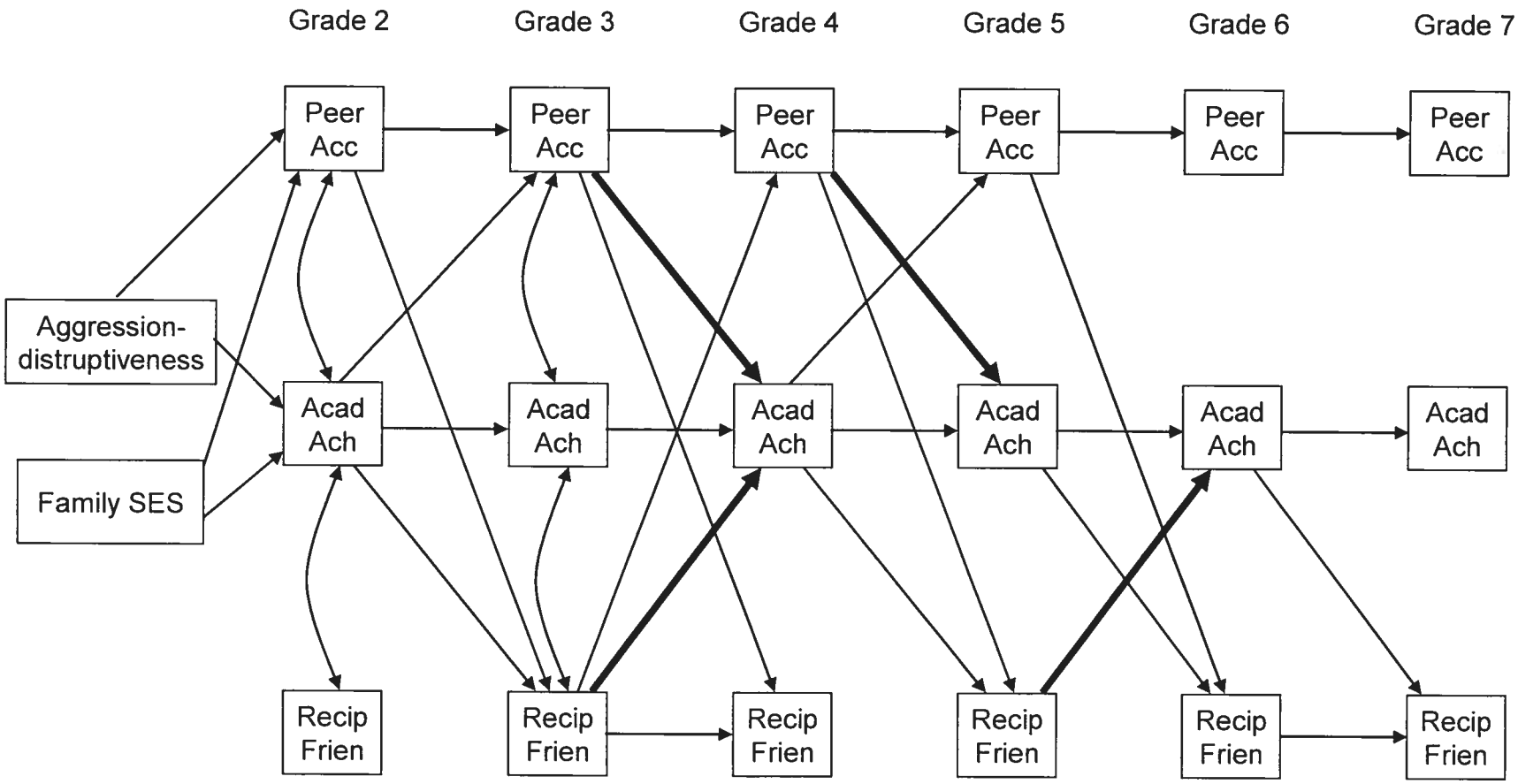


Sequential model



Parallel model

Figure 2


Grade 2
Grade 3
Grade 4
Grade 5
Grade 6
Grade 7
Peer Acc
Aggression-distruptiveness
Acad Ach
Family SES
Recip Frien

Conclusion

Chacun des articles présentés dans cette thèse offre un point de vue unique sur la question du rôle des pairs dans le processus menant à l'obtention du diplôme d'études secondaires et suggère des réponses à des questions précises. Il est toutefois pertinent, à ce stade-ci, d'expliquer comment les réflexions issues des premiers articles ont influencé la réalisation des travaux suivants et, par le fait même, d'offrir une synthèse des découvertes ayant découlé de cette thèse. Pour terminer, les leçons à tirer de ces travaux ainsi que les implications pour les recherches futures seront exposées.

Synthèse des trois articles

L'article 1, dont le but était de synthétiser les plus importants travaux théoriques et empiriques portant sur le rôle des pairs dans le processus menant à la complétion des études secondaires, se trouve à être le véritable point d'ancrage de cette thèse. Voici comment l'article 1 a influencé la conceptualisation des articles 2 et 3.

Utilisation des modèles développementaux pour guider les deux études empiriques

En un premier temps, les différents modèles développementaux (additif, interactif, controuvé et médiateur, ainsi que les sous-types du modèle médiateur) présentés dans l'article 1 (voir les Figures 1 et 2) ont grandement contribué à la conceptualisation des questions de recherche des articles empiriques réalisés par la suite. Puisque des modèles statistiques complexes ont été mis à l'épreuve dans les deux articles empiriques, il s'est avéré fort utile de disposer d'un cadre théorique clair et aussi complet que possible.

L'article 2 comportait un défi important, soit celui de combiner la théorie socio-interactive (Patterson et al., 1989) et la théorie « participation-identification » (Finn, 1989) pour former un seul modèle plus complet. Le fait de travailler avec une structure de base neutre (i.e., le modèle médiateur de type séquentiel) a facilité l'intégration des deux perspectives théoriques en un tout cohérent. Par ailleurs, le modèle médiateur de type

bidirectionnel a été mis à contribution pour répondre aux questions de recherche examinées dans l'article 3. Ce modèle a permis de vérifier l'existence de liens bidirectionnels entre les expériences sociales des élèves (i.e., acceptation par le groupe de pairs et nombre d'amis réciproques) et leur rendement scolaire.

Recension des modèles théoriques et opérationnalisation des variables dans les deux études empiriques

Une deuxième contribution importante de l'article 1 a été de regrouper les idées phares de plusieurs théories en psychologie du développement et en psychologie de l'éducation. Le théoricien ayant le plus fortement influencé les trois articles de cette thèse est Sullivan (1953), puisqu'il a été le premier à proposer que les expériences issues de phénomènes de groupe (ex. acceptation par le groupe de pairs) et les expériences dyadiques (ex. présence d'amis réciproques) contribuaient à des aspects distincts de l'adaptation psychologique des enfants et des adolescents. La première partie de l'article 1 a été structurée en suivant cette catégorisation, et les deux articles empiriques ont été conçus de manière à mettre en évidence la contribution indépendante des deux niveaux d'expérience sociale.

Les idées proposées par d'autres théoriciens ont contribué à l'opérationnalisation des différents types d'expériences avec les pairs dans le cadre des deux études empiriques. Tel que suggéré par Bukowski, Sippola, Hoza, et Newcomb (2000), les instruments utilisés pour mesurer l'acceptation par le groupe de pairs tenaient compte à la fois de la dimension positive et de la dimension négative. En ce qui a trait à l'opérationnalisation du concept d'amitié, l'article 1 a permis de constater qu'un critère généralement reconnu comme essentiel est celui de la réciprocité de la relation (Parker et al., 1995; Rubin et al., 1998). Les deux études empiriques ont tenu compte de cette recommandation. De plus, les propositions théoriques de Hartup (1996) concernant les trois aspects de l'amitié (présence d'ami[s] réciproque[s], caractéristiques des amis réciproques, qualité de la relation

d'amitié) a guidé le choix des variables représentant les expériences dyadiques dans le cadre des deux études empiriques. Dans l'article 2, les caractéristiques comportementales des amis (i.e., leur niveau d'agressivité et de turbulence) est apparu comme l'aspect le plus pertinent à étudier. En effet, l'association à des amis ayant des comportements peu appropriés en milieu scolaire (ex. agressivité et turbulence) est l'une des variables explicitement mentionnées dans le modèle socio-interactif qui guidait cette étude (Patterson et al., 1998). L'article 3 étant plutôt guidé par la théorie interpersonnelle de Sullivan (1953), il est apparu plus pertinent de tenir compte d'un aspect différent du concept d'amitié, soit le nombre d'amis réciproques.

Lacunes des études antérieures et solutions pour y remédier dans le cadre des deux études empiriques

Enfin, la revue des travaux empiriques présentée dans l'article 1 a permis de mettre en lumière les principales lacunes des études réalisées jusqu'à ce jour. Principalement, ces lacunes concernent le choix des variables ainsi qu'un ensemble de questions d'ordre temporel.

Choix des variables

La recension des écrits présentée dans l'article 1 a révélé qu'un grand nombre d'études empiriques avaient négligé de tenir compte de plusieurs variables cruciales. Par exemples, certaines études ne mesuraient qu'un seul niveau d'expérience avec les pairs (ex. Altermatt & Pomerantz, 2005; Doran C. French & Conrad, 2001; O'Neil et al., 1997; Wentzel et al., 2004), et plusieurs ne tenaient pas compte des autres prédicteurs connus de l'adaptation scolaire des élèves, tels leurs antécédents familiaux ou comportementaux (ex. Ladd et al., 1997; Liu & Chen, 2003). L'omission de certaines variables essentielles empêche souvent les chercheurs d'écarter certaines explications alternatives et suggère des relations controuvées par rapport au phénomène sous étude (i.e., l'obtention du diplôme d'études secondaires). Les recommandations de l'article 1 relativement au choix des

variables ont été appliquées dans les deux études empiriques, puisque la plupart des variables de contrôle et des variables indépendantes ont été choisies en se basant sur des propositions théoriques (ex. Buhrmester & Furman, 1986; Finn, 1989; Patterson et al., 1989; Patterson et al., 1998; Patterson et al., 1992; Sullivan, 1953). Certains travaux empiriques (Davis-Kean, 2005; Ladd et al., 1999; Ladd et al., 1997) ou de recension (Rumberger, 1987) ont également été mis à contribution pour raffiner ces choix.

Considérations d'ordre temporel

L'examen des travaux empiriques recensés dans l'article 1 a soulevé de nombreuses considérations d'ordre temporel. Il en est ressorti qu'un défi majeur pour les prochaines études était de construire des plans de recherche qui tiendraient mieux compte du fait que l'être humain, de même que son entourage, sont en transformation constante.

En ce sens, l'article 2 avait pour but d'offrir une vision globale du processus à long terme qui amène certains jeunes à ne pas compléter leurs études secondaires. L'article 3 avait pour objectif d'offrir un complément à l'article 2 en analysant de manière plus détaillée la dynamique sociale et académique qui contribue à orienter les élèves sur une trajectoire positive ou négative relativement à l'obtention du diplôme d'études secondaires.

La principale considération d'ordre temporel ayant influencé l'article 2 est la constatation que peu d'études portant sur les précurseurs de l'obtention du diplôme d'études secondaires utilisent une mesure définitive de cette variable (Doll & Hess, 2001). Notamment, le décrochage avant la fin des études secondaires est fréquemment utilisé comme variable de substitution pour tenter d'identifier les futurs diplômés et non-diplômés (ex. Battin-Pearson et al., 2000; Ellenbogen & Chamberland, 1997). Grâce à son plan de recherche à long terme, l'article 2 a permis d'obtenir une mesure optimale de la variable dépendante, puisque l'obtention du diplôme d'études secondaires a été mesurée à 23 ans—un âge auquel le statut de diplômé ou de non-diplômé est quasi définitif (Bowlby & McMullen, 2005a).

En lien avec les recommandations de l'article 1, l'article 3 visait quant à lui à vérifier l'hypothèse selon laquelle différents types d'expériences avec les pairs jouent un rôle plus ou moins important dépendamment de la période développementale durant laquelle ces expériences prennent place (voir Sullivan, 1953). Par ailleurs, l'article 1 soulignait aussi que l'aspect dynamique des expériences avec les pairs a trop souvent été négligé dans le cadre des recherches portant sur l'adaptation scolaire des élèves. Afin de tenir compte du fait que l'acceptation au sein du groupe de pairs ainsi que les relations d'amitié ne sont guère statiques, ces deux variables ont été mesurées à de multiples reprises. Enfin, l'article 1 encourageait les chercheurs à abandonner une vision univoque du rôle des expériences avec les pairs par rapport au niveau d'adaptation scolaire. En effet, il semble réducteur de ne considérer que les effets possibles de l'environnement social sur un individu, sans tenir compte du fait que les caractéristiques de l'individu puissent aussi influencer son environnement social. C'est pour cette raison que des liens bidirectionnels ont été modélisés dans l'article 3.

Avancées théoriques

La section précédente a démontré que le tour d'horizon théorique et empirique offert par l'article 1 a permis d'orienter les deux études empiriques de cette thèse vers des questions de recherche importantes. La présente section met en lumière les principales découvertes des deux études empiriques.

Tout d'abord, l'article 2 a engendré d'importantes avancées théoriques en offrant un appui significatif à un nouveau modèle théorique issu de la fusion entre le modèle socio-interactif de Patterson et ses collègues (1989) et le modèle « participation-identification » de Finn (1989). En effet, les analyses statistiques ont confirmé que les amitiés réciproques avec des pairs déviants au début de l'adolescence faisaient partie d'une chaîne développementale pouvant expliquer partiellement la corrélation entre les

comportements agressifs et turbulents manifestés à l'enfance et la non-obtention du diplôme au début de l'âge adulte.

Contrairement à l'amitié avec des pairs agressifs et turbulents, une faible acceptation sociale parmi le groupe de pairs durant la préadolescence ne semblait pas jouer de rôle significatif dans la chaîne développementale menant à la non-obtention du diplôme d'études secondaires chez les élèves ayant tendance à être agressifs et turbulents durant l'enfance. Ce résultat va à l'encontre des hypothèses inspirées par la perspective socio-interactive et par les études empiriques précédentes. Toutefois, ce résultat contre-intuitif ne devrait pas être interprété comme la preuve que seules les expériences dyadiques jouent un rôle significatif dans la chaîne développementale menant à la non-obtention du diplôme. Plusieurs explications sont en effet avancées dans l'article 2 pour rendre compte de ce résultat inattendu. Celles-ci ont ensuite été prises en compte lors de la préparation de la deuxième étude empirique de cette thèse. Spécifiquement, l'opérationnalisation de l'acceptation par les pairs a été légèrement modifiée dans l'article 3, de manière à mesurer véritablement l'appréciation des pairs envers chaque participant, sans laisser d'ambiguïté sur la possibilité que le construit mesuré se rapporte à la réputation de l'élève plutôt qu'à son statut social réel au sein du groupe de pairs (voir Parkhurst & Hopmeyer, 1998). De plus, dans l'article 3, le niveau d'acceptation par les pairs a été mesuré durant l'enfance et au début de l'adolescence, ce qui diminue les risques de passer à côté de la période développementale la plus critique pour l'étude de cette variable.

Tout comme l'article 2, l'article 3 a entraîné d'importantes avancées théoriques, car il a permis d'apporter des nuances à la théorie interpersonnelle de Sullivan (1953) dans le cadre spécifique des recherches portant sur le processus d'adaptation scolaire à l'enfance et au début de l'adolescence. Les analyses présentées dans cet article suggèrent que le modèle bidirectionnel séquentiel inspiré par la théorie de Sullivan est moins vraisemblable qu'un modèle alternatif de type bidirectionnel parallèle. Cette découverte est conforme aux résultats de plusieurs études antérieures et elle suggère que les expériences issues de phénomènes de groupe ainsi que les expériences dyadiques pourraient influencer

simultanément le processus d'adaptation scolaire des élèves au primaire. Un examen des liens significatifs et non significatifs du modèle final (i.e., le modèle bidirectionnel parallèle) supporte tout de même un aspect de la théorie de Sullivan, puisque l'acceptation au sein du groupe de pairs ne semble plus jouer de rôle majeur dans le processus d'adaptation scolaire à partir du début de l'adolescence.

Applications concrètes

Aucun lien de causalité n'a pu être établi entre les expériences avec les pairs et le processus d'adaptation scolaire, puisque les plans de recherche utilisés étaient de type corrélationnel. Néanmoins, certains résultats pourraient inspirer les chercheurs en psychologie appliquée qui souhaitent développer des moyens de favoriser la réussite scolaire des enfants et des adolescents, ainsi que les parents, enseignants, éducateurs et autres intervenants qui seraient prêts à collaborer à d'éventuels projets en ce sens.

Tout d'abord, les résultats de l'article 2 soutiennent l'hypothèse que les garçons présentant des comportements agressifs et turbulents dès les premières années de leurs études primaires sont plus à risque de se lier d'amitié avec d'autres garçons ayant un patron de comportement semblable. Étant donné que de telles amitiés sont des antécédents de la non-obtention du diplôme d'études secondaire, les parents de jeunes garçons agressifs et turbulents devraient être incités à superviser les relations de leur enfant de manière à savoir si ce dernier se lie d'amitié avec d'autres enfants agressifs et turbulents, en particulier lors de la transition entre l'enfance et l'adolescence. L'assistance d'autres adultes de la communauté (comme les enseignants, les voisins, ou les responsables des activités de loisir) pourrait s'avérer particulièrement utile dans les milieux défavorisés, puisque plusieurs parents vivant dans ces milieux éprouvent du stress sur les plans financier, psychologique et social, ce qui peut diminuer leur capacité à superviser leurs enfants de manière vigilante. En revanche, les garçons ayant tendance à être agressifs et turbulents devraient être incités à fréquenter des pairs n'ayant pas de problèmes de

comportement et qui fonctionnent bien à l'école. Ces expériences de pairage devraient toutefois être supervisées de près par des adultes compétents afin d'éviter tout risque de dérapage sous la forme d'entraînement à la déviance ou de conflits interpersonnels.

Par ailleurs, les résultats de l'article 3 soutiennent l'hypothèse que la présence d'amis réciproques de même que l'acceptation par le groupe de pairs sont des prédicteurs indépendants du rendement scolaire, tant chez les garçons que chez les filles. Toutefois, il semble que l'acceptation par les pairs joue un rôle significatif principalement durant l'enfance, alors que la contribution des amitiés réciproques pourrait s'échelonner sur les périodes de l'enfance et de l'adolescence. Étant donné que plusieurs programmes visant à favoriser le développement des compétences sociales chez les élèves du primaire existent déjà, il serait pertinent de tenir compte de ces nouvelles découvertes afin de les améliorer. Notamment, l'article 3 suggère qu'il est important d'adapter le contenu de ces ateliers au niveau de développement psychologique des élèves visés, notamment en se concentrant de plus en plus les habiletés propres à l'établissement et au maintien des relations d'amitié au fur et à mesure que les élèves vieillissent. Asher, Parker et Walker (1996) ont notamment élaboré des stratégies différentielles visant à améliorer les habiletés sociales susceptibles de favoriser soit l'acceptation par le groupe de pairs ou encore l'établissement et le maintien des relations d'amitié.

Forces et limites des articles et avenues de recherche future

Les trois articles présentés dans cette thèse apportent une contribution scientifique importante pour le domaine de la psychologie. Cependant, ils présentent aussi certaines limites.

Premièrement, la composition ethnique des échantillons analysés dans les deux études empiriques comporte à la fois des avantages et des inconvénients. D'une part, l'échantillon présenté dans l'article 2, composé de garçons francophones issus de milieux défavorisés de la région de Montréal, est très homogène, ce qui peut limiter la

généralisation des résultats obtenus dans l'article 2. L'échantillon présenté dans l'article 3, qui est composé de garçons et de filles francophones vivant dans une petite ville du nord-ouest québécois, est plus varié sur le plan du statut socio-économique et du sexe des participants, mais les résultats ne peuvent être généralisés à des populations non francophones, non québécoises, rurales ou habitants de grands centres urbains. Par ailleurs, étant donné que la grande majorité des études et des théories ayant inspiré les hypothèses de ces recherches provenaient des États-Unis, les particularités ethniques de ces deux échantillons ont engendré des avancées théoriques cruciales, puisqu'il est désormais possible de généraliser certains aspects de ces théories à une population différente sur le plan de la langue et de la nationalité. En ce sens, il serait souhaitable à l'avenir que les chercheurs établissent des partenariats avec leurs collègues œuvrant dans d'autres pays afin d'élaborer des projets de recherche transculturelle (voir par exemple les travaux de Buchmann & Dalton, 2002; voir aussi Claes et al., 2005). Cela permettrait de vérifier si les aspects des hypothèses qui n'ont pas été confirmés dans les échantillons présentés ici doivent être considérés comme des indices de différences culturelles significatives, ou s'ils doivent être attribués à des explications plus traditionnelles (ex. problèmes relatifs à l'opérationnalisation des variables, problèmes dans la formulation de la théorie).

Par ailleurs, il n'a pas été possible d'explorer les différences sexuelles sur le plan des expériences avec les pairs dans le cadre de l'article 2, puisque cet échantillon était composé uniquement de garçons. Étant donné que le taux de diplomation est plus faible chez les garçons que chez les filles, il aurait été pertinent de vérifier si certaines des variables faisant partie de la chaîne développementale mise à l'épreuve dans l'article 2 pouvaient contribuer à expliquer cet écart entre les sexes. En effet, une analyse multi-groupe comparant garçons et filles aurait peut-être permis d'identifier certains facteurs de risque spécifiques aux élèves masculins. Cette lacune de l'article 2 a été corrigée dans l'article 3, puisque les différences sexuelles ont pu être explorées. Par contre, les analyses ont révélé que les liens entre les variables étudiées n'étaient pas significativement différents chez les garçons et les filles.

D'autre part, les plans de recherche longitudinaux à long terme (17 ans) et à moyen terme (5 ans) pour les articles 2 et 3 respectivement représentent une grande force de ces recherches. Les nombreuses collectes de données s'échelonnant sur plusieurs périodes développementales ont permis de dépasser la simple identification des antécédents de l'obtention du diplôme d'études secondaires et d'enrichir la compréhension des processus en jeu au cours des années d'études primaires et secondaires. Néanmoins, les prochaines études longitudinales pourraient être supérieures aux recherches présentées ici si elles débutaient durant la petite enfance (à l'image de l'étude réalisée par Jimerson et al., 2000) et si elles comportaient plus d'une collecte de données par année, car il est possible que certains types d'expériences sociales (surtout les expériences émergeant de processus dyadiques comme la formation et la rupture des liens d'amitié) varient plus rapidement que prévu, tel que souligné dans la discussion de l'article 3.

Une autre force des études empiriques présentées ici est l'inclusion de plusieurs variables de contrôle pertinentes, ainsi que l'inclusion de variables distinctes permettant de représenter d'une part les expériences issues de phénomènes de groupe et d'autre part les expériences dyadiques. Ces précautions ont eu pour effet d'établir la valeur prédictive de ces variables au-delà de plusieurs prédicteurs connus de l'obtention du diplôme d'études secondaires. Toutefois, il y a encore place à l'amélioration. Les prochaines études portant sur ce thème pourraient notamment considérer plusieurs types d'expériences avec les pairs à chacun des deux niveaux (ex. l'identification à une bande, l'intégration à un réseau social et la position à l'intérieur de celui-ci, la victimisation par les pairs et le niveau de popularité perçue par les pairs pour ce qui est des expériences au niveau du groupe; la qualité de l'amitié et les caractéristiques positives des amis réciproques à l'intérieur et à l'extérieur du système scolaire pour ce qui est des expériences dyadiques).

Aussi, d'autres prédicteurs bien établis de l'adaptation scolaire et de l'obtention du diplôme pourraient être pris en compte. En s'inspirant du modèle écologique de Bronfenbrenner (1979), il apparaît pertinent de tenir compte des facteurs présents à différents niveaux du système social, comme les variables familiales (ex. style parental,

attitudes des membres de la famille, accès à des activités intellectuelles et culturelles à la maison), le climat scolaire (ex. comportements et attitudes du personnel de l'école, accessibilité des activités parascolaires) et même certains aspects de la culture et du climat politique s'il s'agit d'études transculturelles. Minimalement, ces prédicteurs devraient être inclus comme variables de contrôle, mais idéalement, ils devraient se voir attribuer un rôle actif (ex. médiateur, modérateur). Cela permettrait d'en arriver à une compréhension beaucoup plus riche de la dynamique psychosociale contribuant à encourager le succès scolaire des élèves. Enfin, étant donné que la variable « engagement scolaire » a joué un rôle significatif dans le cadre de l'article 2, il appert que les prochaines études devraient laisser davantage de place aux variables de nature cognitive et affective. Les théories issues du domaine de la motivation (comme la théorie de l'autodétermination—R. M. Ryan & Deci, 2000) et de l'éducation (Tinto, 1975) pourraient s'avérer fort utiles en ce sens.

Pour terminer, il est essentiel de souligner que les études corrélationnelles, si bien menées soit-elles, ne pourront jamais remplacer les études expérimentales, puisque ces dernières sont les seules qui permettent d'inférer des relations causales entre les variables à l'étude. Les projets de recherche les plus prometteurs, pour mieux comprendre le rôle des expériences avec les pairs dans le processus menant à l'obtention du diplôme, sont ceux qui visent à mettre sur pied, à évaluer et à perfectionner des programmes de prévention visant, entre autres, à manipuler certains aspects des expériences sociales des élèves. Notamment, les ateliers d'entraînement aux habiletés sociales visant à modifier le niveau d'acceptation sociale d'un élève parmi son groupe de pairs (ex. dos Santos Elias, Marturano, de Almeida Motta, & Giurlana, 2003; Webb, Brigman, & Campbell, 2005) ou à lui permettre de se lier d'amitié avec des pairs qui fonctionnent bien à l'école (ex. Berner, Fee, & Turner, 2001; Lavallee, Bierman, & Nix, 2005) pourraient rehausser la plausibilité d'un lien de causalité entre les expériences positives avec les pairs durant les études primaires et secondaires et le statut de diplômé. Cependant, pour établir de tels liens causaux, il est nécessaire que les collectes de données s'échelonnent jusqu'au début de l'âge adulte.

Malgré ces limites, la présente thèse a donné lieu à d'importantes avancées théoriques, puisqu'elle a contribué au processus de validation de plusieurs théories importantes pour les domaines de la psychologie développementale et de la psychologie de l'éducation (ex. Finn, 1989; Patterson et al., 1989; Sullivan, 1953). De plus, elle a permis d'approfondir les connaissances actuelles quant au rôle de différents types d'expériences avec les pairs. En plus de supporter l'hypothèse selon laquelle les pairs jouent un rôle unique dans le processus menant à l'obtention du diplôme d'études secondaires, les travaux présentés ici tendent à confirmer l'idée que les différents types d'expériences avec les pairs jouent un rôle distinct dans ce processus, qu'ils émergent de phénomènes de groupe ou de phénomènes dyadiques.

Bibliographie

Allison, P. D. (2003). Missing data techniques for structural equation modeling. *Journal of Abnormal Psychology, 112*(4), 545-557.

Altermatt, E. R., & Pomerantz, E. M. (2005). The implications of having high-achieving versus low-achieving friends: A longitudinal analysis. *Social Development, 14*(1), 61-81.

Ary, D. V., Duncan, T. E., Duncan, S. C., & Hops, H. (1999). Adolescent problem behavior: The influence of parents and peers. *Behaviour Research and Therapy, 37*(3), 217-230.

Asher, S. R., Parker, J. G., & Walker, D. L. (1996). Distinguishing friendship from acceptance: Implications for intervention and assessment. In W. M. Bukowski, A. F. Newcomb & W. W. Hartup (Eds.), *The company they keep: Friendship in childhood and adolescence* (pp. 366-403). Cambridge, UK: Cambridge University Press.

Astone, N. M., & McLanahan, S. S. (1991). Family structure, parental practices and high school completion. *American Sociological Review, 56*(3), 309-320.

August, G. J., Hektner, J. M., Egan, E. A., Realmuto, G. M., & Bloomquist, M. L. (2002). The Early Risers longitudinal prevention trial: Examination of 3-year outcomes in aggressive children with intent-to-treat and as-intented analyses. *Psychology of Addictive Behaviors, 16*(4, suppl), S27-S39.

Azmitia, M., & Cooper, C. R. (2001). Good or bad? Peer influences on Latino and European American adolescents' pathways through school. *Journal of Education for Students Placed at Risk, 6*(1-2), 45-71.

Bagwell, C. L., & Coie, J. D. (2004). The best friendships of aggressive boys: Relationship quality, conflict management, and rule-breaking behavior. *Journal of Experimental Child Psychology, 88*(1), 5-24.

Bagwell, C. L., Schmidt, M. E., Newcomb, A. F., & Bukowski, W. M. (2001). Friendship and peer rejection as predictors of adult adjustment. In D. W. Nangle & C. A.

Erdley (Eds.), *The role of friendship in psychological adjustment* (pp. 25-49). San Francisco: Jossey-Bass.

Baker, J. A., Derrer, R. D., Davis, S. M., Dinklage-Travis, H. E., Linder, D. S., & Nicholson, M. D. (2001). The flip side of the coin: Understanding the school's contribution to dropout and completion. *School Psychology Quarterly, 16*(4), 406-426.

Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173-1182.

Battin-Pearson, S., Newcomb, M. D., Abbott, R. D., Hill, K. G., Catalano, R. F., & Hawkins, J. D. (2000). Predictors of early high school dropout: A test of five theories. *Journal of Educational Psychology, 92*(3), 568-582.

Berndt, T. J. (1989). Obtaining support from friends during childhood and adolescence. In D. Belle (Ed.), *Children's social networks and social supports* (pp. 308-331). New York: Wiley.

Berndt, T. J. (1996). Exploring the effects of friendship quality on social development. In W. M. Bukowski, A. F. Newcomb & W. W. Hartup (Eds.), *The company they keep: Friendship in childhood and adolescence* (pp. 346-365). New York: Cambridge University Press.

Berndt, T. J. (1999). Friends' influence on students' adjustment to school. *Educational Psychologist, 34*(1), 15-28.

Berndt, T. J., Hawkins, J. A., & Jiao, Z. (1999). Influences of friends and friendships on adjustment to junior high school. *Merrill-Palmer Quarterly, 45*(1), 13-41.

Berndt, T. J., & Keefe, K. (1995). Friends' influence on adolescents' adjustment to school. *Child Development, 66*(5), 1312-1329.

Berndt, T. J., Laychak, A. E., & Park, K. (1990). Friends' influence on adolescents' academic achievement motivation: An experimental study. *Journal of Educational Psychology, 82*(4), 664-670.

Berndt, T. J., & Perry, T. B. (1990). Distinctive features and effects of early adolescent friendships. In R. Montemayor, G. R. Adams & T. P. Gullotta (Eds.), *From childhood to adolescence : A transitional period?* (pp. 269-287). Newbury Park, CA: Sage Publications.

Berner, M. L., Fee, V. E., & Turner, A. D. (2001). A multi-component social skills training program for pre-adolescent girls with few friends. *Child and Family Behavior Therapy, 23*(2), 1-18.

Bierman, K. L., & Wargo, J. B. (1995). Predicting the longitudinal course associated with aggressive-rejected, aggressive (nonrejected), and rejected (nonaggressive) status. *Development and Psychopathology, 7*(4), 669-682.

Blishen, B. R., Carroll, W. K., & Moore, C. (1987). The 1981 socioeconomic index for occupations in Canada. *Canadian Review of Sociology and Anthropology, 24*, 465-488.

Boivin, M., Hymel, S., & Hodges, E. V. (2001). Toward a process view of peer rejection and harassment. In J. Juvonen & S. Graham (Eds.), *Peer harassment in school: The plight of the vulnerable and victimized* (pp. 265-289). New York: Guilford Press.

Boivin, M., & Vitaro, F. (1995). The impact of peer relationships on aggression in childhood: Inhibition through coercion or promotion through peer support. In J. McCord (Ed.), *Coercion and punishment in long-term perspectives* (pp. 183-197). New York: Cambridge University Press.

Bollen, K. A. (1989). *Structural equations with latent variables*. New York: Wiley.

Bowlby, G., & McMullen, K. (2005a). *Provincial dropout rates -Trends and consequences* (No. 81-004-XIE). Ottawa, Ontario: Statistics Canada.

Bowlby, G., & McMullen, K. (2005b). *Taux de décrochage provinciaux - Tendances et conséquences* (No. 81-004-XIF). Ottawa, Ontario: Statistique Canada.

Boyle, M. H., & Willms, J. D. (2001). Multilevel modelling of hierarchical data in developmental studies. *Journal of Child Psychology and Psychiatry, 42*(1), 141-162.

Brendgen, M., Vitaro, F., & Bukowski, W. M. (1998). Affiliation with delinquent friends: Contributions of parents, self-esteem, delinquent behavior, and rejection by peers. *Journal of Early Adolescence, 18*(3), 244-265.

Brendgen, M., Vitaro, F., Bukowski, W. M., Doyle, A. B., & Markiewicz, D. (2001). Developmental profiles of peer social preference over the course of elementary school: Associations with trajectories of externalizing and internalizing behavior. *Developmental Psychology, 37*(3), 308-320.

Brendgen, M., Wanner, B., Vitaro, F., Bukowski, W. M., & Tremblay, R. E. (2007). Verbal abuse by the teacher during childhood and academic, behavioral, and emotional adjustment in young adulthood. *Journal of Educational Psychology, 99*(1), 26-38.

Bronfenbrenner, U. (1979). *The ecology of human development*. Cambridge, MA: Harvard University Press.

Brown, B. B. (1990). Peer groups and peer cultures. In S. S. Feldman & G. R. Elliott (Eds.), *At the threshold: The developing adolescent* (pp. 171-196). Cambridge, MA: Harvard University Press.

Brown, B. B., Eicher, S. A., & Petrie, S. (1986). The importance of peer group ("crowd") affiliation in adolescence. *Journal of Adolescence, 9*(1), 73-96.

Brown, B. B., & Huang, B. H. (1995). Examining parenting practices in different peer contexts: Implications for adolescent trajectories. In L. J. Crockett & A. C. Crouter

(Eds.), *Pathways through adolescence: Individual development in relation to social contexts* (pp. 151-176). Mahwah, NJ: Lawrence Erlbaum Associates.

Buchmann, C., & Dalton, B. (2002). Interpersonal influences and educational aspirations in 12 countries: The importance of institutional context. *Sociology of Education, 75*(2), 99-122.

Buhrmester, D. (1996). Need fulfillment, interpersonal competency, and the developmental contexts of early adolescent friendship. In W. M. Bukowski, A. F. Newcomb & W. W. Hartup (Eds.), *The company they keep: Friendship in childhood and adolescence* (pp. 158-185). New York: Cambridge University Press.

Buhrmester, D., & Furman, W. (1986). The changing functions of friends in childhood: A neo-sullivanian perspective. In V. J. Derlega & B. A. Winstead (Eds.), *Friendship and social interaction* (pp. 41-62). New York: Springer-Verlag.

Bukowski, W. M., & Hoza, B. (1989). Popularity and friendship: Issues in theory, measurement, and outcome. In T. J. Berndt & G. W. Ladd (Eds.), *Peer Relationships in Child Development* (pp. 15-45). New York: John Wiley & Sons.

Bukowski, W. M., Hoza, B., & Boivin, M. (1994). Measuring friendship quality during pre- and early adolescence: The development and psychometric properties of the friendship qualities scale. *Journal of Social and Personal Relationships, 11*(3), 471-484.

Bukowski, W. M., Pizzamiglio, M., Newcomb, A. F., & Hoza, B. (1996). Popularity as an affordance for friendship: The link between group and dyadic experience. *Social Development, 5*(2), 189-202.

Bukowski, W. M., Sippola, L., Hoza, B., & Newcomb, A. F. (2000). Pages from a sociometric notebook: An analysis of nomination and rating scale measures of acceptance, rejection, and social preference. In A. H. N. Cillessen & W. M. Bukowski (Eds.), *Recent advances in the measurement of acceptance and rejection in the peer system* (pp. 11-26). San Francisco: Jossey-Bass.

Burk, W. J., & Laursen, B. (2005). Adolescent perceptions of friendship and their associations with individual adjustment. *International Journal of Behavioral Development, 29*(2), 156-164.

Burks, V. S., Dodge, K. A., & Price, J. M. (1995). Models of internalizing outcomes of early rejection. *Development and Psychopathology, 7*(4), 683-695.

Cairns, R., Xie, H., & Leung, M.-C. (1998). The popularity of friendship and the neglect of social networks: Toward a new balance. In W. M. Bukowski & A. H. Cillessen (Eds.), *Sociometry then and now: Building on six decades of measuring children's experiences with the peer group* (pp. 25-53). San Francisco: Jossey-Bass.

Cairns, R. B., Cairns, B. D., & Neckerman, H. J. (1989). Early school dropout: Configurations and determinants. *Child Development, 60*(6), 1437-1452.

Chen, J. J. L. (2005). Relation of academic support from parents, teachers, and peers to Hong Kong adolescents' academic achievement: The mediating role of academic engagement. *Genetic, Social, and General Psychology Monographs, 131*(2), 77-127.

Christenson, S. L., Sinclair, M. F., Lehr, C. A., & Godber, Y. (2001). Promoting successful school completion: Critical conceptual and methodological guidelines. *School Psychology Quarterly, 16*(4), 468-484.

Cicchetti, D. (1993). Developmental psychopathology: Reactions, reflections, projections. *Developmental Review, 13*(4), 471-502.

Claes, M., Lacourse, É., Ercolani, A.-P., Pierro, A., Leone, L., & Fabio, P. (2005). Parenting, peer orientation, drug use, and antisocial behavior in late adolescence: A cross-national study. *Journal of Youth and Adolescence, 34*(5), 401-411.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, N.J.: Erlbaum.

Coie, J. D. (1990). Toward a theory of peer rejection. In S. R. Asher & J. D. Coie (Eds.), *Peer rejection in childhood* (pp. 365-401). New York: Cambridge University Press.

Coie, J. D. (2004). The impact of negative social experiences on the development of antisocial behavior. In J. B. Kupersmidt & K. A. Dodge (Eds.), *Children's peer relations: From development to intervention* (pp. 243-267). Washington DC: American Psychological Association.

Coie, J. D., & Dodge, K. A. (1983). Continuities and changes in children's social status: A five-year longitudinal study. *Merrill-Palmer Quarterly, 29*(3), 261-282.

Coie, J. D., Dodge, K. A., & Coppotelli, H. (1982). Dimensions and types of social status: A cross-age perspective. *Developmental Psychology, 18*(4), 557-570.

Coie, J. D., Dodge, K. A., & Kupersmidt, J. B. (1990). Peer group behavior and social status. In S. R. Asher & J. D. Coie (Eds.), *Peer rejection in childhood* (pp. 17-59). New York: Cambridge University Press.

Coie, J. D., Lochman, J. E., Terry, R., & Hyman, C. (1992). Predicting early adolescent disorder from childhood aggression and peer rejection. *Journal of Consulting and Clinical Psychology, 60*(5), 783-792.

Crockett, L., Losoff, M., & Peterson, A. C. (1984). Perceptions of the peer group and friendship in early adolescence. *Journal of Early Adolescence, 4*(2), 155-181.

Davis-Kean, P. E. (2005). The influence of parent education and family income on child achievement: The indirect role of parental expectations and the home environment. *Journal of Family Psychology, 19*(2), 294-304.

Deater-Deckard, K. (2001). Annotation: Recent research examining the role of peer relationships in the development of psychopathology. *Journal of Child Psychology and Psychiatry, 42*(5), 565-579.

Delgado-Gaitan, C. (1996). Adolescent peer influence and differential school performance. *Journal of Adolescent Research, 1*(4), 449-462.

DeRosier, M. E., Kupersmidt, J. B., & Patterson, C. J. (1994). Children's academic and behavioral adjustment as a function of the chronicity and proximity of peer rejection. *Child Development, 65*(6), 1799-1813.

Dishion, T. J., Andrews, D. W., & Crosby, L. (1995). Antisocial boys and their friends in early adolescence: Relationship characteristics, quality, and interactional process. *Child Development, 66*(1), 139-151.

Dishion, T. J., McCord, J., & Poulin, F. (1999). When interventions harm: Peer groups and problem behavior. *American Psychologist, 54*(9), 755-764.

Dishion, T. J., Patterson, G. R., Stoolmiller, M., & Skinner, M. L. (1991). Family, school, and behavioral antecedents to early adolescent involvement with antisocial peers. *Developmental Psychology, 27*(1), 172-180.

Dodge, K. A., & Pettit, G. S. (2003). A biopsychosocial model of the development of chronic conduct problems in adolescence. *Developmental Psychology, 39*(2), 349-371.

Doise, W., Mugny, G., & Perret-Clermont, A.-N. (1975). Social interaction and the development of cognitive operations. *European Journal of Social Psychology, 5*(3), 367-383.

Doll, B., & Hess, R. S. (2001). Through a new lens: Contemporary psychological perspectives on school completion and dropping out of high school. *School Psychology Quarterly, 16*(4), 351-356.

dos Santos Elias, L. C., Marturano, E. M., de Almeida Motta, A. M., & Giurlana, A. G. (2003). Treating boys with low school achievement and behavior problems: Comparison of two kinds of intervention. *Psychological Reports, 92*(1), 105-116.

DuBois, D. L., Felner, R. D., Brand, S., Adan, A. M., & Evans, E. G. (1992). A prospective study of life stress, social support, and adaptation in early adolescence. *Child Development, 63*(3), 542-557.

Dunphy, D. C. (1963). The social structure of urban adolescent peer groups. *Sociometry, 26*(2), 230-246.

Education Department. (2001). *Indicateurs de l'éducation, Édition 2002* [Education Indicators, 2002 Edition] (No. 2002 -- 01-01209). Quebec, QC, Canada: Gouvernement du Québec.

Ekstrom, R. B., Goertz, M. E., Pollack, J. M., & Rock, D. A. (1986). Who drops out of high school and why? Findings from a national study. *Teachers College Record, 87*(3), 356-373.

Ellenbogen, S., & Chamberland, C. (1997). The peer relations of dropouts: A comparative study of at-risk and not at-risk youths. *Journal of Adolescence, 20*(4), 355-367.

Elliott, D. S., Wilson, W. J., Huizinga, D., Sampson, R. J., Elliott, A., & Rankin, B. (1996). The effects of neighborhood disadvantage on adolescent development. *Journal of Research in Crime and Delinquency, 33*(4), 389-426.

Entwisle, D. R., Alexander, K. L., & Olson, L. S. (2004). Temporary as compared to permanent high school dropout. *Social Forces, 82*(3), 1181-1205.

Finn, J. D. (1989). Withdrawing from school. *Review of Educational Research, 59*(2), 117-142.

Fonzi, A., Schneider, B. H., Tani, F., & Tomada, G. (1997). Predicting children's friendship status from their dyadic interaction in structured situations of potential conflict. *Child Development, 68*(3), 496-506.

French, D. C., & Conrad, J. (2001). School dropout as predicted by peer rejection and antisocial behavior. *Journal of Research on Adolescence, 11*(3), 225-244.

French, D. C., Conrad, J., & Turner, T. M. (1995). Adjustment of antisocial and nonantisocial rejected adolescents. *Development and Psychopathology, 7*(4), 857-874.

Frentz, C., Gresham, F. M., & Elliott, S. N. (1991). Popular, controversial, neglected, and rejected adolescents: Contrasts of social competence and achievement differences. *Journal of School Psychology, 29*(2), 109-120.

Furman, W. (1982). Children's friendships. In T. M. Field (Ed.), *Review of human development* (pp. 327-339). New York: Wiley.

Furman, W., & Bierman, K. L. (1984). Children's conceptions of friendship: A multimethod study of developmental changes. *Developmental Psychology, 20*(5), 925-931.

Furman, W., & Robbins, P. (1985). What's the point? Issues in the selection of treatment objectives. In B. H. Schneider, K. H. Rubin & J. E. Ledingham (Eds.), *Children's peer relations: Issues in assessment and intervention* (pp. 41-56). New York: Springer-Verlag.

Gest, S. D., Graham-Bermann, S. A., & Hartup, W. W. (2001). Peer experience: Common and unique features of number of friendships, social network centrality, and sociometric status. *Social Development, 10*(1), 23-40.

Gifford-Smith, M. E., & Brownell, C. A. (2003). Childhood peer relationships: Social acceptance, friendships, and peer networks. *Journal of School Psychology, 41*(4), 235-284.

Graham, S., Bellmore, A. D., & Mize, J. (2006). Peer victimization, aggression, and their co-occurrence in middle school: Pathways to adjustment problems. *Journal of Abnormal Child Psychology, 34*(3), 363-378.

Hartup, W. W. (1996). The company they keep: Friendships and their developmental significance. *Child Development, 67*(1), 1-13.

Hartup, W. W., & Sancilio, M. F. (1986). Children's friendships. In E. Schopler & G. B. Mesibov (Eds.), *Social behavior in autism* (pp. 61-79). New York: Plenum Press.

Hatzichristou, C., & Hopf, D. (1996). A multiperspective comparison of peer sociometric status groups in childhood and adolescence. *Child Development, 67*(3), 1085-1102.

Hox, J. J. (2002). *Multilevel analysis: Techniques and applications*. Mahway, NJ: Erlbaum.

Hymel, S., Comfort, C., Schonert-Reichl, K., & McDougall, P. (1996). Academic failure and school dropout: The influence of peers. In J. Juvonen & K. R. Wentzel (Eds.), *Social motivation: Understanding children's school adjustment.* (pp. 313-345). New York: Cambridge University Press.

Janosz, M., Fallu, J.-S., & Deniger, M.-A. (2000). La prévention du décrochage scolaire : Facteurs de risque et efficacité des programmes d'intervention [Preventing school dropout: Risk factors and efficacy of prevention programs]. In F. Vitaro & C. Gagnon (Eds.), *Prévention des problèmes d'adaptation chez les enfants et les adolescents. Tome II : Les problèmes externalisés* (pp. 115-164). Québec, QC, Canada: Presses de l'Université du Québec.

Janosz, M., Le Blanc, M., Boulerice, B., & Tremblay, R. E. (2000). Predicting different types of school dropouts: A typological approach with two longitudinal samples. *Journal of Educational Psychology, 92*(1), 171-190.

Jimerson, S. R., Egeland, B., Sroufe, L., & Carlson, B. (2000). A prospective longitudinal study of high school dropouts: Examining multiple predictors across development. *Journal of School Psychology, 38*(6), 525-549.

Juvonen, J., Nishina, A., & Graham, S. (2000). Peer harassment, psychological adjustment, and school functioning in early adolescence. *Journal of Educational Psychology, 92*(2), 349-359.

Kandel, D. B. (1978). Homophily, selection, and socialization in adolescent friendships. *American Journal of Sociology, 84*(2), 427-436.

Kaplan, D. S., Damphousse, K. R., & Kaplan, H. B. (1994). Mental health implications of not graduating from high school. *Journal of Experimental Education, 62*(2), 105-123.

Keating, D. P. (1990). Adolescent thinking. In S. S. Feldman & G. R. Elliott (Eds.), *At the threshold: The developing adolescent* (pp. 54-89). Cambridge, MA: Harvard University Press.

Kerckhoff, A. C., & Bell, L. (1998). Early adult outcomes of students at "risk". *Social Psychology of Education, 2*(1), 81-102.

Kindermann, T. A., McCollam, T. L., & Gibson, E., Jr. (1996). Peer networks and students' classroom engagement during childhood and adolescence. In J. Juvonen & K. R. Wentzel (Eds.), *Social motivation: Understanding children's school adjustment* (pp. 279-312). New York: Cambridge University Press.

Kohl, G. O., Lengua, L. J., & McMahon, R. J. (2000). Parent involvement in school: Conceptualizing multiple dimensions and their relations with family and demographic risk factors. *Journal of School Psychology, 38*(6), 501-523.

Kosir, K., & Pecjak, S. (2005). Sociometry as a method for investigating peer relationships: What does it actually measure? *Educational Research, 47*(1), 127-144.

Krohn, M. D., Thornberry, T. P., Collins-Hall, L., & Lizotte, A. J. (1995). School dropout, delinquent behavior, and drug use: An examination of the causes and consequences of dropping out of school. In H. B. Kaplan (Ed.), *Drugs, Crime and Other Deviant Adaptations: Longitudinal Studies* (pp. 163-183). New York: Plenum Press.

Kupersmidt, J. B., & Coie, J. D. (1990). Preadolescent peer status, aggression, and school adjustment as predictors of externalizing problems in adolescence. *Child Development, 61*(5), 1350-1362.

Kurdek, L. A., & Sinclair, R. J. (1988). Adjustment of young adolescents in two-parent nuclear, stepfather, and mother-custody families. *Journal of Consulting and Clinical Psychology, 56*(1), 91-96.

Ladd, G. W. (1983). Social networks of popular, average, and rejected children in school settings. *Merrill-Palmer Quarterly, 29*(3), 283-307.

Ladd, G. W. (1990). Having friends, keeping friends, making friends, and being liked by peers in the classroom: Predictors of children's early school adjustment? *Child Development, 61*(4), 1081-1100.

Ladd, G. W., Birch, S. H., & Buhs, E. S. (1999). Children's social and scholastic lives in kindergarten: Related spheres of influence? *Child Development, 70*(6), 1373-1400.

Ladd, G. W., & Burgess, K. B. (2001). Do relational risks and protective factors moderate the linkages between childhood aggression and early psychological and school adjustment? *Child Development, 72*(5), 1579-1601.

Ladd, G. W., & Kochenderfer, B. J. (1996). Linkages between friendship and adjustment during early school transitions. In W. M. Bukowski, A. F. Newcomb & W. W. Hartup (Eds.), *The company they keep : Friendship in childhood and adolescence* (pp. 322-345). New York: Cambridge University Press.

Ladd, G. W., Kochenderfer, B. J., & Coleman, C. C. (1996). Friendship quality as a predictor of young children's early school adjustment. *Child Development, 67*(3), 1103-1118.

Ladd, G. W., Kochenderfer, B. J., & Coleman, C. C. (1997). Classroom peer acceptance, friendship, and victimization: Distinct relational systems that contribute uniquely to children's school adjustment? *Child Development, 68*(6), 1181-1197.

Ladd, G. W., & Troop-Gordon, W. (2003). The role of chronic peer difficulties in the development of children's psychological adjustment problems. *Child Development, 74*(5), 1344-1367.

Laird, R. D., Jordan, K. Y., Dodge, K. A., Pettit, G. S., & Bates, J. E. (2001). Peer rejection in childhood, involvement with antisocial peers in early adolescence, and the development of externalizing behavior problems. *Development and Psychopathology, 13*(2), 337-354.

Lansford, J. E., Criss, M. M., Pettit, G. S., Dodge, K. A., & Bates, J. E. (2003). Friendship quality, peer group affiliation, and peer antisocial behavior as moderators of the link between negative parenting and adolescent externalizing behavior. *Journal of Research on Adolescence, 13*(2), 161-184.

Lavallee, K. L., Bierman, K. L., & Nix, R. L. (2005). The impact of first-grade "friendship group" experiences on child social outcomes in the Fast Track program. *Journal of abnormal child psychology, 33*(3), 307-324.

Le Blanc, M., Janosz, M., & Langelier-Biron, L. (1993). Abandon scolaire et prévention spécifique: Antécédents sociaux et personnels [School dropout and specific prevention: Social and personal precursors]. *Apprentissage et Socialisation, 16*(1-2), 43-64.

Liu, M., & Chen, X. (2003). Friendship networks and social, school and psychological adjustment in Chinese junior high school students. *Psychology in the Schools, 40*(1), 5-17.

McCaul, E. J., Donaldson Jr., G. A., Coladarci, T., & Davis, W. E. (1992). Consequences of dropping out of school: Findings from high school and beyond. *Journal of Educational Research, 85*(4), 198-207.

Mechanic, D. (1983). Adolescent health and illness behavior: Review of the literature and a new hypothesis for the study of stress. *Journal of Human Stress, 9*(2), 4-13.

Moffitt, T. E., Avshalom, C., & Rutter, M. (2005). Strategy for investigating interactions between measured genes and measured environments. *Archives of General Psychiatry, 62*(5), 473-481.

Morissette, R., & Johnson, A. (2004). *Gains des couples peu scolarisés et très scolarisés sur le marché du travail au Canada, 1980-2000* (No. 11-621-MIF2004017). Ottawa, Ontario: Statistique Canada.

Mounts, N. S., & Steinberg, L. (1995). An ecological analysis of peer influence on adolescent grade point average and drug use. *Developmental Psychology, 31*(6), 915-922.

Muthén, L., & Muthén, B. O. (2004). *MPlus users' guide (3rd ed.)*. Los Angeles, CA: Muthén & Muthén.

Nagin, D. S. (1999). Analyzing developmental trajectories: A semiparametric group-based approach. *Psychological Methods, 4*(2), 1-19.

Newcomb, A. F., & Bagwell, C. L. (1995). Children's friendship relations: A meta-analytic review. *Psychological Bulletin, 117*(2), 306-347.

Newcomb, A. F., & Bukowski, W. M. (1983). Social impact and social preference as determinants of children's peer group status. *Developmental Psychology, 19*(6), 856-867.

Newcomb, A. F., Bukowski, W. M., & Pattee, L. (1993). Children's peer relations: A meta-analytic review of popular, rejected, neglected, controversial, and average sociometric status. *Psychological Bulletin, 113*(1), 99-128.

Newsom, J. T., & Nishishiba, M. (2002). *Nonconvergence and sample bias in hierarchical linear modeling of dyadic data*.Unpublished manuscript, Portland State University. Available from http://www.upa.pdx.edu/IOA/newsom/papers.htm

Nichols, J. D., & White, J. (2001). Impact of peer networks on achievement of high school algebra students. *Journal of Educational Research, 94*(5), 267-273.

O'Neil, R., Welsh, M., Parke, R. D., Wang, S., & Strand, C. (1997). A longitudinal assessment of the academic correlates of early peer acceptance and rejection. *Journal of Clinical Child Psychology, 26*(3), 290-303.

Ollendick, T. H., Weist, M. D., Borden, M. C., & Greene, R. W. (1992). Sociometric status and academic, behavioral, and psychological adjustment: A five-year longitudinal study. *Journal of Consulting and Clinical Psychology, 60*(1), 80-87.

Olweus, D. (1993). Bully-victim problems among schoolchildren: Long-term consequences and an effective intervention program. In S. Hodgins (Ed.), *Mental disorder and crime* (pp. 317-349). Newbury Park, CA: Sage Publications.

Organisation for Economic Co-operation and Development. (2005). Rationale for creating a global forum on education. In *Education Global Forum 2005.* Retrieved May 26, 2006, from http://www.oecd.org/document/56/0,2340,en_21571361_35013845_35123640_1_1_1_1,00.html

Parke, R. D., O'Neil, R., Spitzer, S., Isley, S., Welsh, M., Wang, S., et al. (1997). A longitudinal assessment of sociometric stability and the behavioral correlates of children's social acceptance. *Merrill-Palmer Quarterly, 43*(4), 635-662.

Parker, J. G., & Asher, S. R. (1987). Peer relations and later personal adjustment: Are low-accepted children at risk? *Psychological Bulletin, 102*(3), 357-389.

Parker, J. G., & Asher, S. R. (1993a). Beyond group acceptance: Friendship and friendship quality as distinct dimensions of children's peer adjustment. *Advances in Personal Relationships, 4*, 261-294.

Parker, J. G., & Asher, S. R. (1993b). Friendship and friendship quality in middle childhood: Links with peer group acceptance and feelings of loneliness and social dissatisfaction. *Developmental Psychology, 29*(4), 611-621.

Parker, J. G., Rubin, K. H., Erath, S. A., Wojslawowicz, J. C., & Buskirk, A. A. (2006). Peer relationships, child development, and adjustment: A developmental psychopathology perspective. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology: Vol. 1. Theory and method* (2nd ed., pp. 419-493). Hoboken, NJ: John Wiley & Sons.

Parker, J. G., Rubin, K. H., Price, J. M., & DeRosier, M. E. (1995). Peer relationships, child development, and adjustment: A developmental psychopathology perspective. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology* (Vol. 2. Risk, disorder, and adaptation, pp. 96-161). New York: Wiley.

Parkhurst, J. T., & Hopmeyer, A. (1998). Sociometric popularity and peer-perceived popularity: Two distinct dimensions of peer status. *Journal of Early Adolescence, 18*(2), 125-144.

Patterson, G. R., DeBaryshe, B. D., & Ramsey, E. (1989). A developmental perspective on antisocial behavior. *American Psychologist, 44*(2), 329-335.

Patterson, G. R., Forgatch, M. S., Yoerger, K. L., & Stoolmiler, M. (1998). Variables that initiate and maintain an early-onset trajectory for juvenile offending. *Development and Psychopathology, 10*(3), 531-547.

Patterson, G. R., Reid, J. B., & Dishion, T. J. (1992). *Antisocial boys*. Eugene, OR: Castalia.

Pekarik, E. G., Prinz, R. J., Liebert, D. E., Weintraub, S., & Neale, J. M. (1976). The Pupil Evaluation Inventory: A sociometric technique for assessing children's social behavior. *Journal of Abnormal Child Psychology, 4*(1), 83-97.

Pettit, G. S., Clawson, M. A., Dodge, K. A., & Bates, J. E. (1996). Stability and change in peer-rejected status: The role of child behavior, parenting, and family ecology. *Merrill-Palmer Quarterly, 42*(2), 267-294.

Piaget, J. (1975). *L'équilibration des structures cognitives : Problème central du développement [The equilibration of cognitive structures]*. Paris: Presses Universitaires de France.

Piaget, J. (1977). *La naissance de l'intelligence chez l'enfant* (Neuvième ed.). Paris: Delachaux et Niestlé.

Piaget, J. (1978). *Le Jugement moral chez l'enfant [The moral judgement of the child]* (5e ed.). Paris: Presses universitaires de France.

Pianta, R. C., & Stuhlman, M. W. (2004). Teacher-child relationships and children's success in the first years of school. *School Psychology Review, 33*(3), 444-458.

Pittman, R. B. (1991). Social factors, enrollment in vocational / technical courses, and high school dropout rates. *Journal of Educational Research, 84*(5), 288-295.

Risi, S., Gerhardstein, R., & Kistner, J. (2003). Children's classroom peer relationships and subsequent educational outcomes. *Journal of Clinical Child and Adolescent Psychology, 32*(3), 351-361.

Rogoff, B. (1990). *Apprenticeship in thinking: Cognitive development in social context*. New York: Oxford University Press.

Rose, A. J. (2002). Co-rumination in the friendships of girls and boys. *Child Development, 73*(6), 1830-1843.

Rubin, K. H., Bukowski, W., & Parker, J. G. (1998). Peer interactions, relationships, and groups. In W. Damon (Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (5th ed., pp. 619-700). New York: Wiley.

Rudolph, K. D., & Asher, S. R. (2000). Adaptation and maladaptation in the peer system: Developmental processes and outcomes. In A. J. Sameroff, M. Lewis & S. M. Miller (Eds.), *Handbook of Developmental Psychopathology* (2nd ed., pp. 157-175). New York: Plenum.

Rumberger, R. W. (1987). High school dropouts: A review of issues and evidence. *Review of Educational Research, 57*(2), 101-121.

Rutter, M., & Maughan, B. (2002). School effectiveness findings 1979-2002. *Journal of School Psychology, 40*(6), 451-475.

Ryan, A. M. (2001). The peer group as a context for the development of young adolescent motivation and achievement. *Child Development, 72*(4), 1135-1150.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68-78.

Sabongui, A. G., Bukowski, W. M., & Newcomb, A. F. (1998). The peer ecology of popularity: The network embeddedness of a child's friend predicts the child's subsequent popularity. In W. M. Bukowski & A. H. Cillessen (Eds.), *Sociometry then and now: Building on six decades of measuring children's experiences with the peer group* (pp. 83-91). San Francisco, CA: Jossey-Bass.

Salmivalli, C., Lagerspetz, K., Bjorkqvist, K., Osterman, K., & Kaukiainen, A. (1996). Bullying as a group process: Participant roles and their relations to social status within the group. *Aggressive Behavior, 22*(1), 1-15.

Schwartz, D., Gorman, A. H., Nakamoto, J., & McKay, T. (2006). Popularity, social acceptance, and aggression in adolescent peer groups: Links with academic performance and school attendance. *Developmental Psychology, 42*(6), 1116-1127.

Schweinhart, L. J., Barnes, H. V., & Weikart, D. P. (1993). *Significant benefits: The High/Scope Perry Preschool Study through age 27.* Ypsilanti, MI: High/Scope Educational Research Foundation.

Shrum, W., & Cheek, N. H., Jr. (1987). Social structure during the school years: Onset of the degrouping process. *American Sociological Review, 52*(2), 218-223.

Silver, R. B., & Eddy, J. M. (2006). Research-based prevention programs and practices for delivery in schools that decrease the risk of deviant peer influence. In K. A. Dodge, T. J. Dishion & J. E. Lansford (Eds.), *Deviant peer influences in programs for youth: Problems and solutions* (pp. 253-277). New York: Guilford Press.

Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence.* New York: Oxford University Press.

Steinberg, L., Dornbusch, S. M., & Brown, B. B. (1992). Ethnic differences in adolescent achievement : An ecological perspective. *American Psychologist, 47*(6), 723-729.

Sullivan, H. S. (1953). *The interpersonal theory of psychiatry*. New York: W.W. Norton.

Taylor, A. R. (1989). Predictors of peer rejection in early elementary grades: Roles of problem behavior, academic achievement, and teacher preference. *Journal of Clinical Child Psychology, 18*(4), 360-365.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research, 45*(1), 89-125.

Tremblay, R. E., Desmarais-Gervais, L., Gagnon, C., & Charlebois, P. (1987). The Preschool Behaviour Questionnaire: Stability of its factor structure between cultures, sexes, ages and socioeconomic classes. *International Journal of Behavioral Development, 10*(4), 467-484.

Tremblay, R. E., Vitaro, F., Gagnon, C., Piché, C., & Royer, N. (1992). A prosocial scale for the Preschool Behaviour Questionnaire: Concurrent and predictive correlates. *International Journal of Behavioral Development, 15*(2), 227-245.

Valentine, J. C., Cooper, H., Bettencourt, B. A., & DuBois, D. L. (2002). Out-of-school activities and academic achievement: The mediating role of self-beliefs. *Educational Psychologist, 37*(4), 245-256.

Véronneau, M.-H., Vitaro, F., Pedersen, S., & Tremblay, R. E. (2007). Do peers contribute to the likelihood of secondary school graduation among disadvantaged boys? *Manuscript submitted for publication.*

Véronneau, M.-H., Vitaro, F., Wanner, B., & Tremblay, R. E. (2004). *Social experiences with peers during early adolescence as predictors of high school graduation.* Poster session presented at the Tenth Biennial meeting of the Society for Research on Adolescence, Baltimore, MA.

Vitaro, F., Brendgen, M., Larose, S., & Tremblay, R. E. (2005). Kindergarten disruptive behaviors, protective factors, and educational achievement by early adulthood. *Journal of Educational Psychology, 97*(4), 617-629.

Vitaro, F., Larocque, D., Janosz, M., & Tremblay, R. E. (2001). Negative social experiences and dropping out of school. *Educational Psychology, 21*(4), 401-415.

Vitaro, F., Pedersen, S., & Brendgen, M. (2007). Children's disruptiveness, peer rejection, friends' deviancy, and delinquent behaviors: A process-oriented approach. *Development and Psychopathology, 19*(2), 433-453.

Vitaro, F., Tremblay, R. E., Gagnon, C., & Boivin, M. (1992). Peer rejection from kindergarten to grade 2: Outcomes, correlates, and prediction. *Merrill-Palmer Quarterly, 38*(3), 382-400.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Webb, L. D., Brigman, G. A., & Campbell, C. (2005). Linking school counselors and student success: A replication of the student success skills approach targeting the academic and social competence of students. *Professional School Counseling, 8*(5), 407-413.

Wei, H. S., & Williams, J. H. (2004). Relationship between peer victimization and school adjustment in sixth-grade students: Investigating mediation effects. *Violence and Victims, 19*(5), 557-571.

Welsh, M., Parke, R. D., Widaman, K., & O'Neil, R. (2001). Linkages between children's social and academic competence: A longitudinal analysis. *Journal of School Psychology, 39*(6), 463-481.

Wentzel, K. R. (2003). Sociometric status and adjustment in middle school: A longitudinal study. *Journal of Early Adolescence, 23*(1), 5-28.

Wentzel, K. R. (2005). Peer relationships, motivation, and academic performance at school. In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of competence and motivation* (pp. 279-296). New York: Guilford Press.

Wentzel, K. R., Barry, C. M., & Caldwell, K. A. (2004). Friendships in middle school: Influences on motivation and school adjustment. *Journal of Educational Psychology, 96*(2), 195-203.

Wentzel, K. R., & Caldwell, K. (1997). Friendships, peer acceptance, and group membership: Relations to academic achievement in middle school. *Child Development, 68*(6), 1198-1209.

Woodward, L. J., & Fergusson, D. M. (2000). Childhood peer relationship problems and later risks of educational under-achievement and unemployment. *Journal of Child Psychology and Psychiatry, 41*(2), 191-201.

Zeman, K., Knighton, T., & Bussière, P. (2004). *Aperçu des cheminements liés aux études et au marché du travail des jeunes Canadiens de 20 à 22 ans* (No. 81-595-MIF2004018). Ottawa, Ontario: Statistique Canada et Ressources humaines et Développement des compétences Canada.